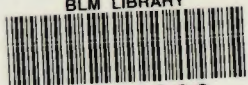


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Jenny Creek Late-Successional Reserve Assessment

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January 2000
Submitted for Regional Ecosystem Office Review

John F. Kennedy
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CHAPTER 1

INTRODUCTION, GENERAL CONDITIONS, HISTORIC AND SPECIAL LAND USES

INTRODUCTION

Late-Successional Reserves

In 1994, the Record of Decision on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl (NFP/ROD) established a network of Late-Successional Reserves (LSR), to include 100-acre activity centers, and Managed Lake Successional Areas. Accompanying this was a set of management standards and guidelines. One goal of these standards and guidelines is to maintain late-successional and old-growth forest species habitat (LSOG) and ecosystems on federal lands. Another goal of management is to maintain biological diversity associated with native species and ecosystems. Forest ecosystems are quite variable throughout the range of the northern spotted owl (NSO). Therefore, site-specific knowledge of forest ecosystems is incorporated into LSR assessments (LSRA). As directed, LSRAs are to be prepared for each designated LSR or group of smaller LSRs before habitat manipulation activities are designed and implemented.

The Jenny Creek LSR 247 is located in interior southwest Oregon near the California border. It is south of the Oregon South Cascades Dead Indian Plateau LSR 227 (Winema and Rogue River National Forest), east of Mount Ashland LSR 248 (Rogue River National Forest) and north of the California Cascades Gooseneck LSR 363 (Klamath National Forest) (see Map 1-1).

Late-successional forests are those forest seral stages that include the mature and old-growth age classes (USDA and USDI 1994). The structure and composition of these forests vary by forest type, site capability, and disturbance regime. Typically, the stands include live old trees, standing dead trees (snags), and fallen trees or logs. In mixed conifer forests, other features include multiple canopy layers, and in pine dominated forests, stands under normal conditions are relatively open with relatively fewer snags and logs. The age at which a stand develops late-successional characteristics varies. In moist climates on productive sites, late-successional characteristics can develop in as early as 80 years. On dry sites, as typically found in interior southwest Oregon, stands may be well over 140 years before these characteristics develop.

Late-successional reserves are to be managed to protect and enhance conditions of late-successional and old-growth forest ecosystems, which serve as habitat for late-successional and old-growth related species including the northern spotted owl (NSO). These reserves are designed to maintain a functional, interacting, late-successional and old-growth forest ecosystem (NFP/ROD, C-11). These reserves should be protected from large-scale fires, insect and disease epidemics, and major human

impacts. The intent is to maintain natural ecosystem processes such as gap dynamics, natural regeneration, pathogenic fungal activity, insect herbivory, and low intensity fire. The stands and guidelines encourage the use of silvicultural practices to accelerate the development of overstocked young plantations into stands with LSOG characteristics, and to reduce the risk to LSRs from severe impacts resulting from large-scale disturbance and unacceptable loss of habitat (NFP/ROD, B-1)

The direction given in the NFP ROD's set of standards and guidelines govern all management activities within LSRs and were incorporated into the Medford District Resource Management Plan Record of Decision (RMP/ROD) and can be found in several sections of that document. This assessment tiers directly to the RMP/ROD and the NFP/ROD.

Purpose of LSR Assessment

This assessment is an administrative document intended to provide information to managers on existing conditions and needs as well as treatment criteria for any future management projects. This document serves as a guide so managers can prioritize and make decisions on management strategies and projects designed to further the LSR objectives. The Jenny Creek LSRA may be amended to reflect monitoring results and new scientific information as they become available.

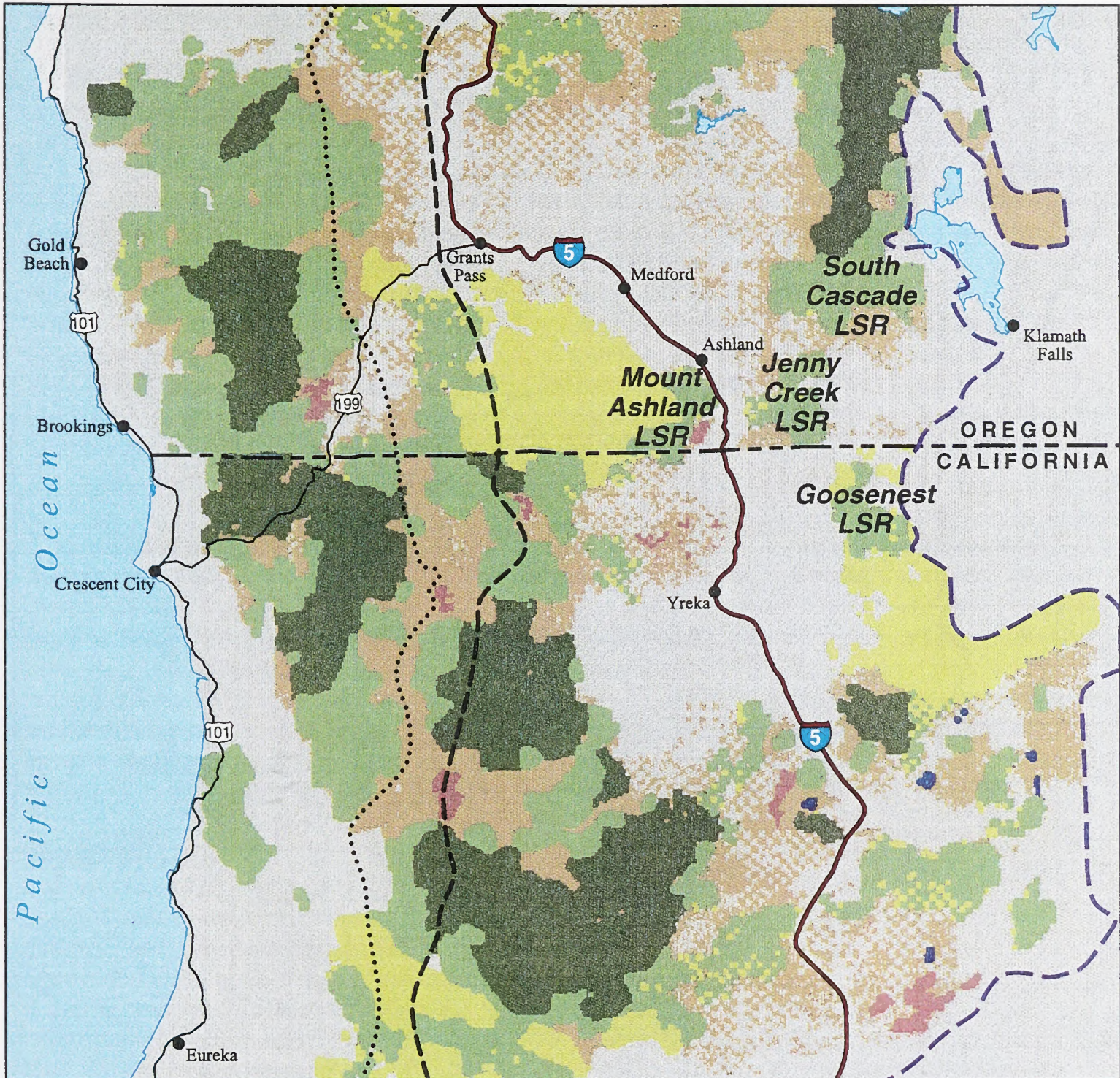
LSRAs should generally include the following eight elements (NFP/ROD, C-11):

1. A history and inventory of overall vegetative conditions within the reserve (Chapter 2);
2. A list of identified late-successional associated species known to exist within the LSR and information on their locations (Chapter 2 and Appendix);
3. A history and description of current land uses within the reserve (Chapter 1);
4. A fire management plan (Appendix I);
5. Criteria for developing appropriate treatments (Chapter 4);
6. Identification of specific areas that could be treated under those criteria (Chapter 4);
7. A proposed implementation schedule tiered to higher order plans (Chapter 4); and
8. Proposed monitoring and evaluation components to help evaluate if future activities are carried out as intended and achieve desired results (Chapter 5).

Management assessments are to be prepared for each designated LSR or group of smaller LSRs before habitat manipulation activities are designed and implemented. This LSRA is a mid-level planning document providing information and criteria to ensure consistency with LSR objectives. It is not project specific, is not a decision document and does not preclude the need for National Environmental Policy Act (NEPA) documentation for project implementation. NFP Region Ecosystem Office (REO) review has been accomplished through this assessment for certain activities. This presumes the activity, criteria, and applicable standards and guidelines are followed in the amounts specified.

Jenny Creek Late Successional Reserve

Physical Relationship Between Jenny Creek LSR and Neighboring LSRs



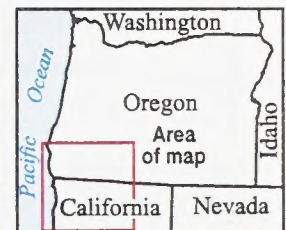
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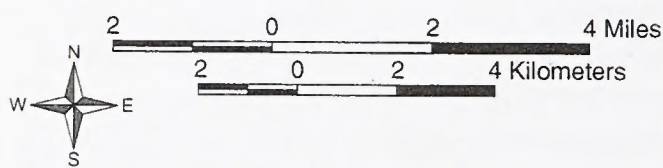
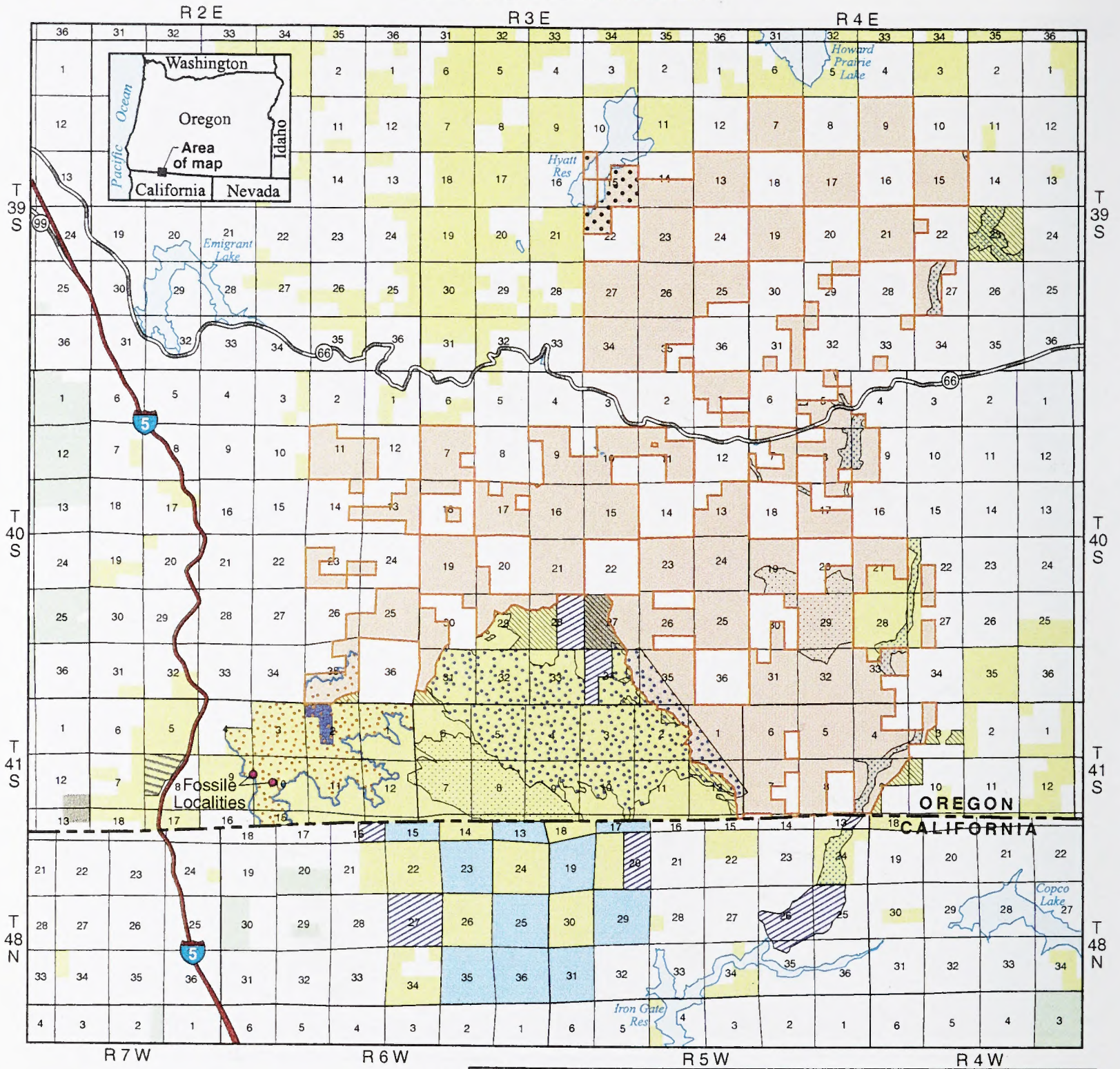
- Congressionally Reserved Area
- Late-Successional Reserve
- Managed Late-Successional Area
- Administratively Withdrawn Area
- Adaptive Management Area
- Matrix
- Other
- Eastern Limit of the Northern Spotted Owl Range
- Eastern Limit of the Marbled Murrelet (Zone 1)
- Eastern Limit of the Marbled Murrelet (Zone 2)



MAP 1-1

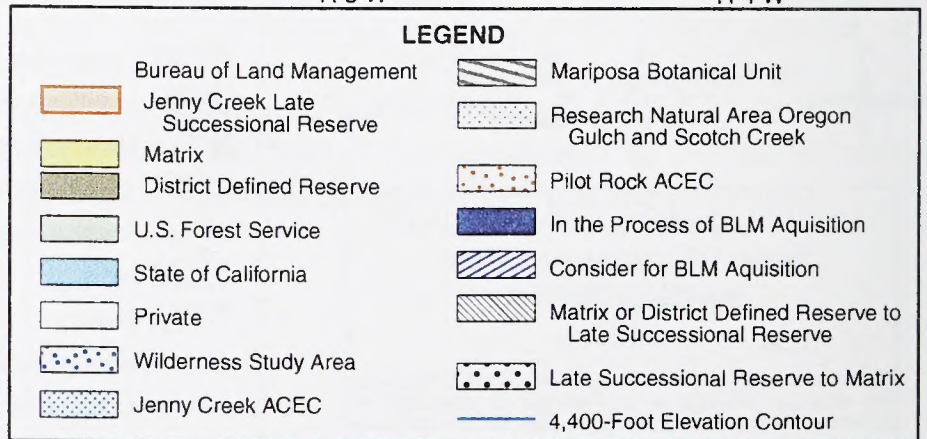
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Jenny Creek Late Successional Reserve Location of the JCLSR



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MAP 1-2

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Area of Assessment

The Jenny Creek LSR is comprised of 34,007 acres of public lands managed by the Medford Bureau of Land Management (BLM) in southeastern Jackson County, Oregon, in portions of Townships 39, 40, 41 South, Ranges 02, 03, 04 East (Willamette Meridian) (see Map 1-2). Using ecological units as a basis, the analysis area is located within three physiographic provinces: Western Cascades, Eastern Cascades, and the Klamath physiographic province as defined in the NFP (NFP/ROD A-3). As a result of the variation in physiographic characteristics the LSR is divided into four ecoregions: the Klamath Mountains (37 percent), Southern Cascades (30 percent), Eastern Cascade Slopes (16 percent) and Siskiyou Foothills (17 percent) (Pater et al. 1997a and 1997b) (see Map 1-3). There are several components of LSRs, mapped and unmapped. This LSRA covers the Jenny Creek LSR 247 and 100-acre areas known spotted owl activity centers (mapped LSRs), and certain Protection Buffer and Survey and Manage species areas (unmapped LSRs), found within 10 miles of the mapped LSR and within the four identified ecoregions.

The LSR boundary extends in the north from Hyatt Reservoir and Howard Prairie Reservoir Recreation Areas, in the east along the western portions of the Jenny Creek, in the south through Agate Flat and the California border and north of the Soda Mountain Wilderness Study Area (WSA) and in the west through Upper Bear Creek-Emigrant Creek watershed parallel to I-5 and Highway 66 (see Map 1-2). The higher elevation white fir and mixed conifer forests are interspersed with brushfields and meadows. Grasslands, shrublands, and oak woodlands are found at lower elevations and south-facing slopes. The 34,007 acre Jenny Creek LSR is interspersed with 32,245 acres of private lands and comprises 51 percent of the 66,252 acre assessment area. This public ownership pattern is typical of the western Oregon BLM "checkerboard" O & C Railroad lands.

An adjustment in LSR boundary has been proposed and recommended. Based on an examination of existing boundary lines, operation logistics, and habitat quality within and adjacent to the LSR, two major boundary adjustments have been recommended: (1) addition of the "Southern Slivers" areas adjacent to the Soda Mountain WSA reallocating approximately 1,488 acres from land use allocation matrix to LSR and (2) substitution of Jenny Creek Section 23, 649 acres of matrix acreage for Hyatt Lake Recreation Site Section 15 and 22, 562 acres of LSR acreage (see Map 1-2). Both the "Southern Slivers" and Section 23 include NSO activity centers; the Hyatt Lake Recreation Site does not. The proposed boundary adjustments are discussed in Chapter 4. The baseline acreage for this LSRA includes the recommended addition of the Southern Slivers areas. A REO review and RMP amendment or plan maintenance will be required to make these LSR boundary adjustments.

Jenny Creek LSR Assessment

The management goal in the Jenny Creek LSR is to maintain, protect, and restore conditions and functions of late-successional and old-growth forest ecosystems in the maximum amounts sustainable through time. These goals are consistent with the objectives and standards established in the

NFP/ROD and the Medford RMP/ROD. Accomplishing these goals through effective management will assist in protecting, maintaining and enhancing LSOG habitat in this LSR.

Protection measures focus on reducing the risk of large-scale disturbance, including stand-replacing fire, insect and disease epidemics, and major human-caused impacts. Climatic and cultural changes have affected the distribution of forest types, fire ignition and behavior patterns, and subsequent ecological effects in the assessment area. Aggressive fire suppression and prevention over the last 80 years have allowed fuels to accumulate and enabled forest types that are less fire resistant to become more widely distributed. Stand structures now typically include more down/dead material and ladder fuels of shrubs, hardwoods, and shade-tolerant understory trees. This often creates the potential for crown fires resulting in increased large tree mortality and late successional habitat degradation, which is especially a concern in LSRs. Risk reduction treatments are proposed.

Document Organization

This document is organized into five chapters. This first chapter, "Introduction, General Conditions, and Historic Land Uses" reviews some of the general physical conditions, natural events which have affected the conditions, and historic land uses. The second chapter assesses the current vegetation and habitat conditions of the LSR. Chapter 3, "Desired Conditions," describes the desired conditions for terrestrial habitats and late-successional sustainability. Chapter 4, "Management Recommendations," outlines criteria to be used for identifying potential treatments in the LSRs and identifies specific treatments, if appropriate, to be proposed now and in the future. Lastly, Chapter 5 describes LSR monitoring.

The assessment descriptions and treatment recommendations attempt to bridge three general user groups: (1) people who work primarily by using plant community descriptions, (2) people working with plant and animal habitat, and (3) the traditional silviculturists/foresters/range conservationists who use tree size and age classes and/or vegetative condition (forest health) to analyze forests/rangeland condition and prescribe treatments.

Ecological Setting

The BLM, and other agencies, have adopted an ecological approach to management that applies to federal lands and research programs. The Jenny Creek LSR is complex in that it is composed of four ecoregions that are defined by a number of site factors, general plant communities, and their potential to provide suitable late-successional habitat.

The four ecoregions are described using plant community descriptions, plant and animal habitat, and forest/range land conditions. For late-successional habitat descriptions this assessment uses current and potential NSO habitat types. These habitat types, a modified McKelvie system, are defined in Table 2-4: their acreage presented in Table 2-5 by ecoregion; desired condition in Table 3-3; and have recommended treatments summarized in Table 4-12. Within the Jenny Creek LSR the LSOG

habitat is fragmented by natural site potential and has been further fragmented by land ownership patterns, past management activities and other disturbance factors.

Approximately 21,037 acres (62 percent) of the BLM administered LSR lands have the site potential to support late-successional habitat as defined by the NSO habitat types. Currently there are 10,525 acres (31 percent) of NSO suitable habitat. Another 10,512 acres (31%) has site potential to be enhanced/restored to NSO suitable habitat. The long term LSR goal is to maintain over the long term at least 18,000 acres or 85%+ of the 21,037 acres in suitable NSO habitat. Table 1-1 summarizes the current and potential amount of NSO suitable (nesting, roosting, foraging[NRF]) habitat by ecoregion.

Table 1-1. Current and potential NSO nesting, roosting, foraging (NRF) habitat acreages by ecoregion

Ecoregion	BLM Acreage	Current NSO NRF Acres (percent)	Potential NSO NRF Acres (percent)
Siskiyou Foothills (78b)	5,779	3,064 (53%)	4,191 (73%)
Southern Cascade Slopes (9i)	5,591	557 (10%)	1,526 (27%)
Klamath River Ridges (78g)	12,418	1,765 (14%)	6,224 (50%)
Southern Cascades (4g)	10,219	5,139 (50%)	9,096 (89%)
Total Acres	34,007	10,525 (31%)	21,037 (62%)

Enhancement of LSRs includes silvicultural treatments designed to accelerate the development of late-successional characteristics throughout the LSR, or within specific species habitat areas that have been determined to be future potential suitable habitat. It also includes closing or decommissioning non-essential roads to reduce road and crossing densities and thereby reduce the potential for sedimentation to the aquatic resources. This document defines the desired conditions (Chapter 3) and contains a series of recommended treatments and activities to protect, maintain and/or enhance late-successional habitat by ecoregions (Chapter 4).

Maintenance and enhancement treatments are proposed in stands greater than 80 years old. These treatments are considered site specific treatments, will require a Medford RMP/ROD amendment, and removal of trees over 20 inch diameter would remain subject to REO project review.

Management Objectives

The recommended treatment guidelines described in Chapter 4 are intended to be followed during the planning of projects within and adjacent to this LSR. Objectives that will guide the process for development and application of LSR treatments are listed below:

- I. Promote the continued development of LSOG characteristics.
- II. Protect existing and potential LSOG from threats of habitat loss that occur both within and outside the LSR.
- III. Promote connectivity of LSOG habitat within and adjacent to the LSR.
- IV. Retain, protect, and restore watershed functions that result in high quality habitat for native fish and other aquatic organisms.
- V. Manage, promote and enhance health of non-forest habitats, their plant communities and botanical integrity.
- VI. Promote and enhance desired biodiversity across the LSR with emphasis to meet special land use objectives.

Except for purposes of landscape context, this LSRA is not intended to reiterate management strategy contained in other documents that are relevant to the Jenny Creek area. Documents, such as habitat management plans, recovery plans, wilderness plans, and watershed analyses, should be used in conjunction with this assessment, as appropriate, when interdisciplinary teams or managers consider landscape issues or context.

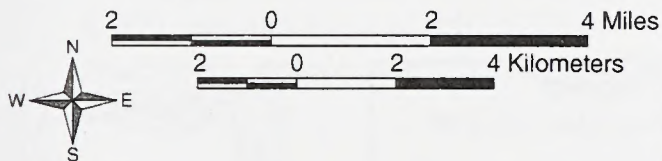
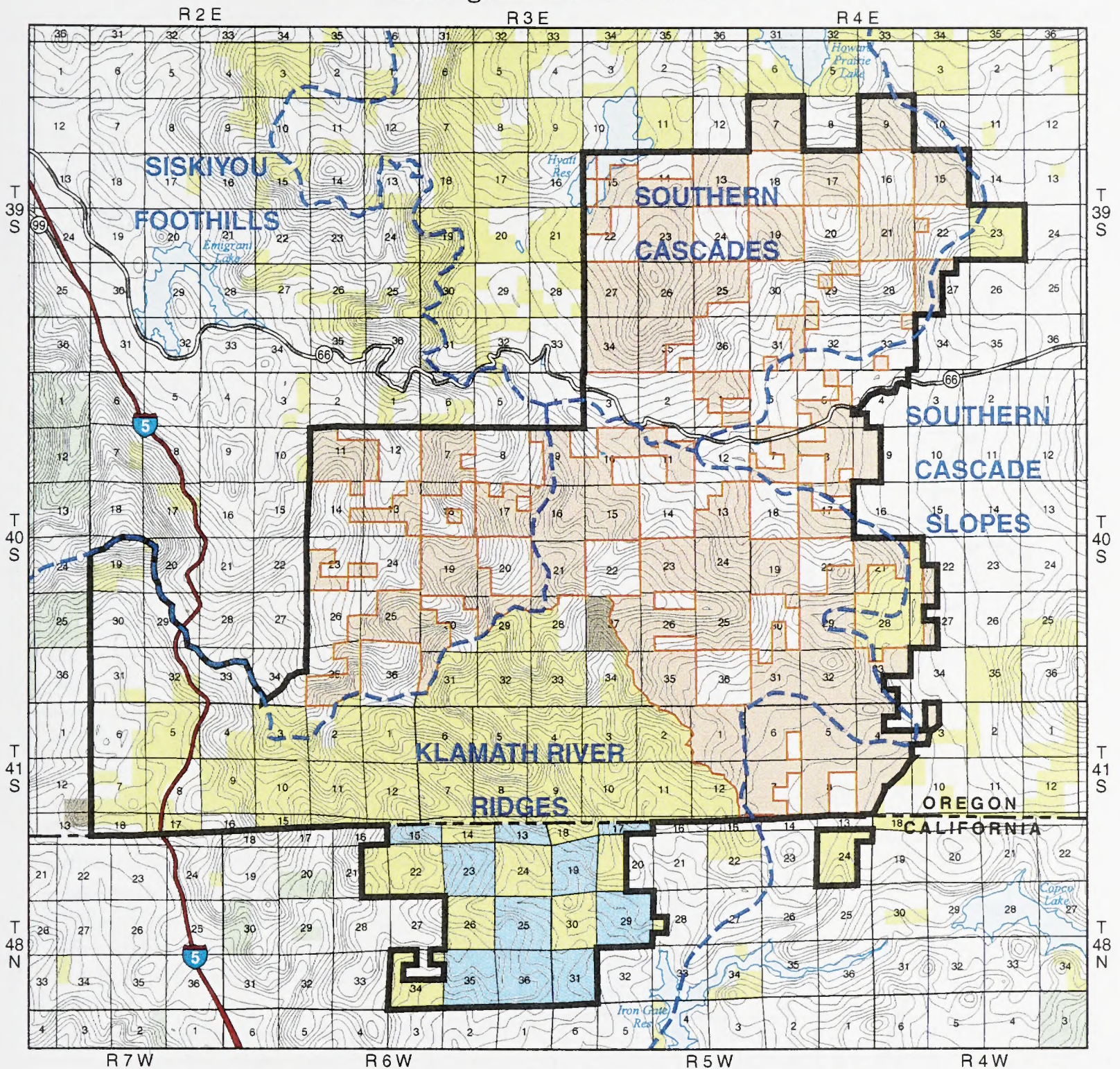
This LSRA is not a decision document. It does not result in specific projects or activities. The assessment resulted in management objectives listed by priority for the LSR. For any projects or activities proposed in the LSR, agency policy policies and procedures regarding NEPA and planning regulations should be followed. Managers should use this assessment to establish criteria and guidelines in reaching prudent site-specific decisions.

Background of the Jenny Creek LSR

Prior to the development of the NFP, there were several attempts to develop conservation plans for the spotted owl and other late-successional associated species found in the forests of the Pacific Northwest. These planning attempts were aimed at addressing growing concerns about the viability of many species of forest wildlife in general, and the NSO specifically. A common feature of all of these plans was a system of habitat reserves along the Cascades. Different plans had different boundaries for the reserves; however, they all showed a reserve in the general area of the Jenny Creek LSR.

The US Fish and Wildlife Service (USFWS) designated Critical Habitat Units (CHUs) on federal lands throughout the range of the NSO after the species was listed as threatened (see Map 1-4). The purpose of the CHUs was to provide essential nesting, roosting, foraging, and dispersal habitat for the species to ensure its long-term viability. The specific purpose of CHU OR-38 was to provide genetic

Jenny Creek Late Successional Reserve Ecoregions and Elevation

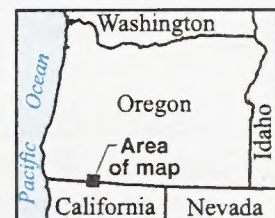


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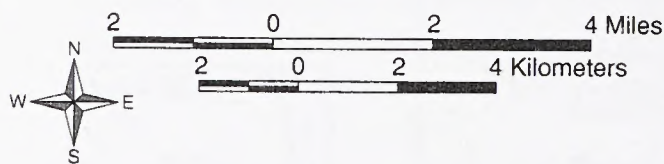
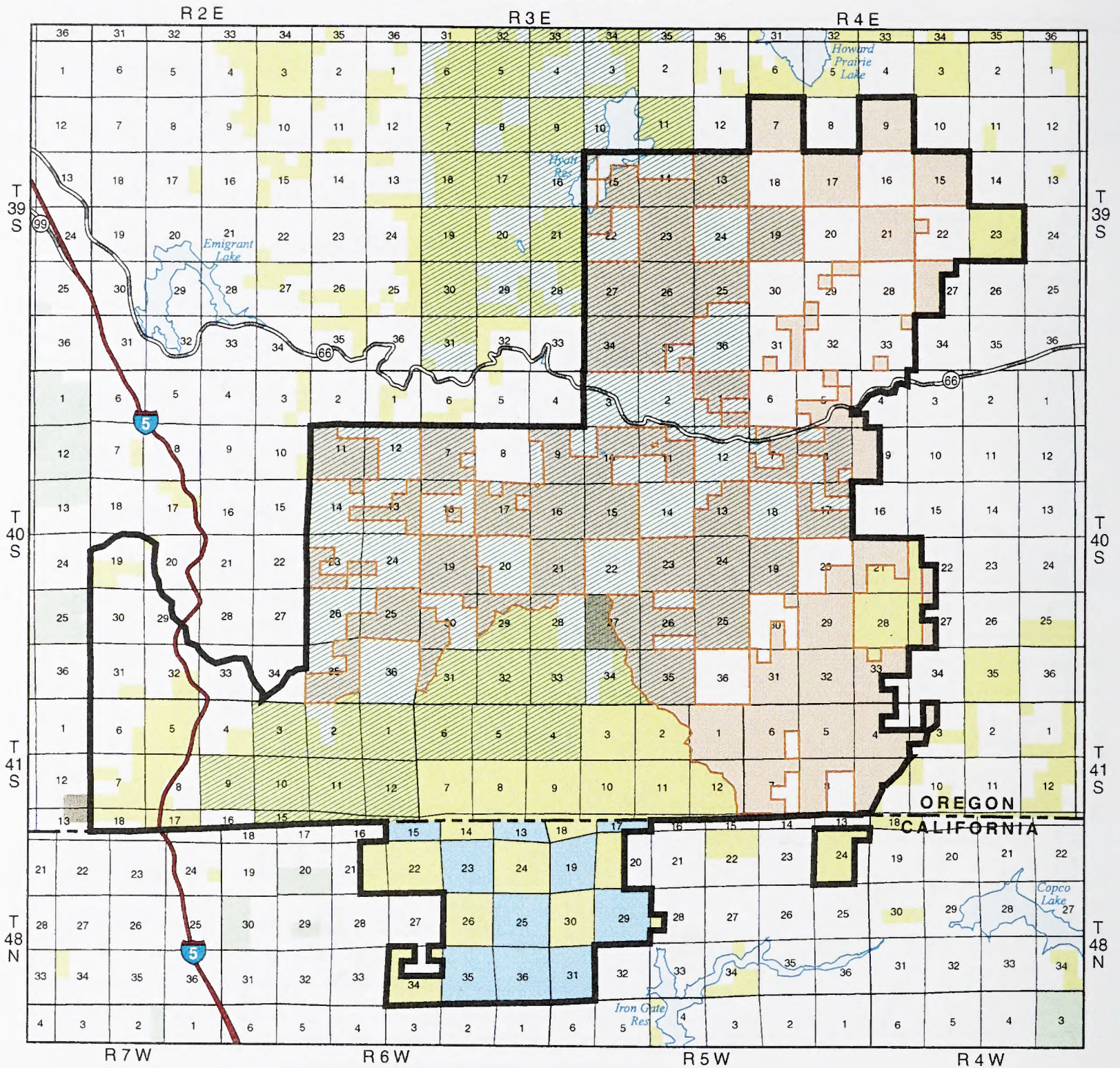
- Bureau of Land Management
- Jenny Creek Late Successional Reserve
- Matrix
- District Defined Reserve
- U.S. Forest Service
- State of California
- Private
- Ecoregion Boundary
- Cascade Siskiyou Ecological Emphasis Analysis Area
- Elevation Countour--Interval 100 Feet



MAP 1-3

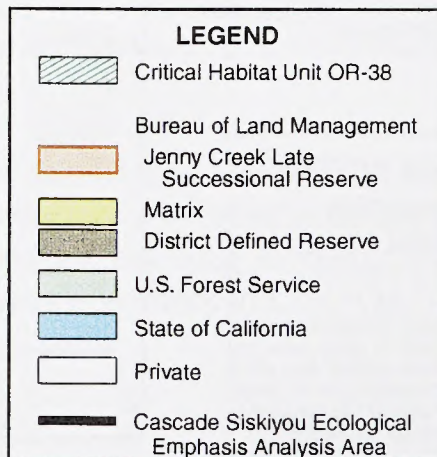
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Jenny Creek Late Successional Reserve Critical Habitat Unit OR-38



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MAP 1-4

linkage between the Western Cascades and Klamath Province spotted owl populations through the I-5 Area of Concern. The Jenny Creek LSR lies on the eastern flank of the I-5 Area of Concern and overlaps much of the CHU OR-38 designated acreage. This area is one of the few places within the range of the northern spotted owl where relatively intact forested habitat bridges the gap between the Klamath Mountain range and the interior Cascades Mountain range, and thus provides a high potential for east-west genetic exchange.

The LSRs were established in the NFP according to the previous work on the spotted owl and a conceptual framework of "Clusters and Connectivity." The basic idea was to have a "cluster" of breeding pairs of spotted owls in each of the large LSRs, and to ensure connectivity between the LSRs throughout the lands designated as Matrix and Riparian Reserves.

GENERAL CONDITIONS

The Jenny Creek LSR is part of a range-wide network designed in association with other land allocations to provide functional mature and late seral habitat, including long-term dispersal and migratory pathways. The Southern Cascades and Klamath Mountains provide north-south and mid-to-high elevation routes. Each ecoregion has its own unique or shared complement of species associated with the inland continental climate. Jenny Creek LSR provides two pathways, north-south and east-west, to link the Cascades and Klamath Mountains (see Map 1-1).

Climate

Jenny Creek LSR lies within the influence of the continental climate of the Great Basin and the more moderate wetter oceanic influences to the west. Local climate is further influenced by mountain topography and elevation. Winter storms generally come from the west over the Pacific Ocean. Summers are usually hot and dry, with occasional thunderstorms with lightning and with or without precipitation. These summer storm events are usually more frequent in the LSR than in the Rogue Valley due to the influence moisture-laden air drawn up from the southwest along the eastside of the Sierra Nevada and Cascade Mountains.

Annual precipitation varies from a low of 22.6 inches at Agate Flat to a high of 40 or more inches at Chinquapin and Soda Mountain. On average, snowpack is present from December to February above 4,000 feet elevation and from December to March above 5,300 feet elevation. In the Emigrant Creek watershed, annual precipitation is 22 inches at lower elevations and 40 inches above 4,000 feet elevation.

The closest weather station is at Howard Prairie Dam (4,573 feet elevation) just to the north of the Jenny Creek LSR. Based on a 30-year average, annual temperatures average 43.6 F in July and August with an average maximum of a little over 78 F and January with an average minimum of 19.3 F. Annual precipitation is 31.4 inches, total snowfall is 135.8 with one inch or more of snow on the

ground for 133 days (Tarwood 1996). The averages presented by Tarwood (1996) cover the 30-year period from July 1965 to July 1994. These differ slightly from the averages provided by the Oregon Climate Service, which cover the period from 1961-1990.

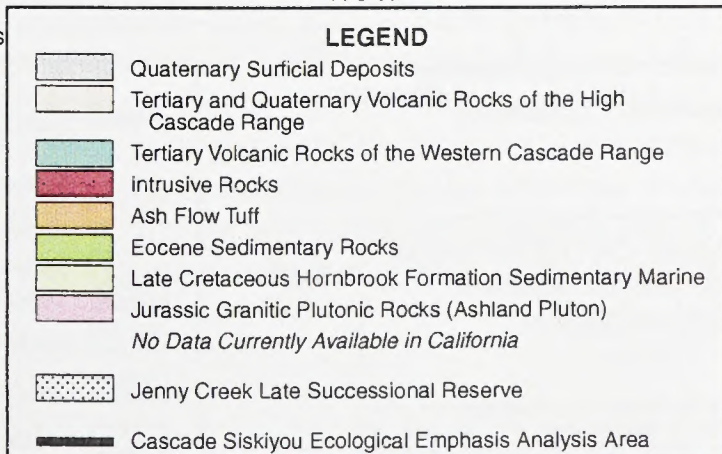
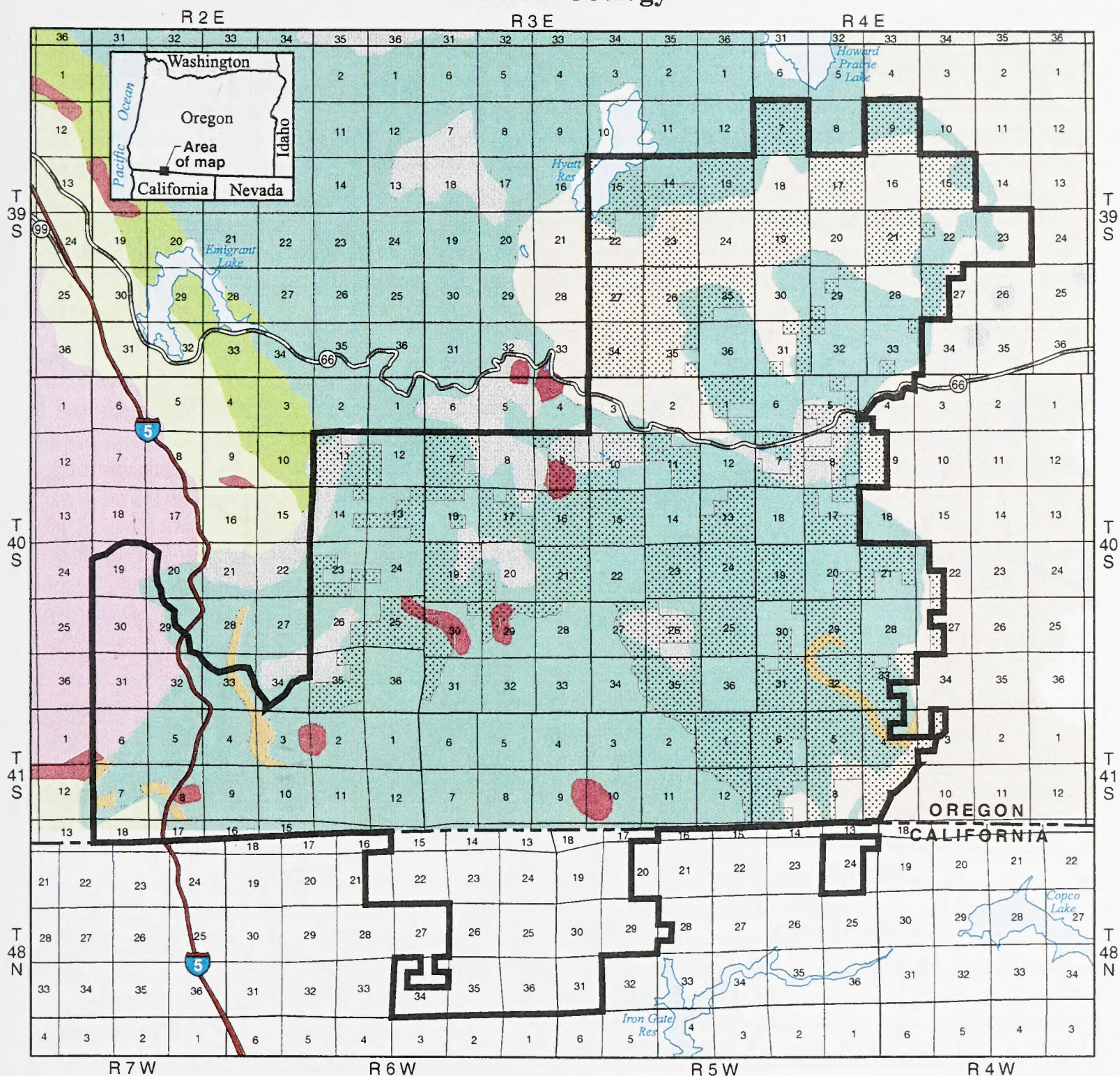
Geology-Geomorphology

The Jenny Creek LSR area consists of volcanic landforms comprised of the Western Cascade geologic subprovince of the Cascade Mountains (Map 1-5). The Western Cascades developed from both large composite and shield volcanos. A large majority of the Western Cascades are dominated in this area by lava flows of basaltic andesite, basalt, and andesite. These lavas are interlayered with softer proclastic flows of andesitic tuff, basaltic breccia, ash flow tuff, dacite tuff, and andesitic breccia. These pyroclastic materials often interfinger with the lavas making the area subject to mass wasting during rain-on-snow or intense storm events. The rocks are 8 to 20 million years old. The surface landscape is complex with moderately steep uplands that are dissected and vertically convex and concave due to natural differential erosional processes and uplift. The drainage patterns in the LSR area are deeply dissected and well-developed in response to landsliding and surface erosion.

Features of special interest for management consideration include slide areas (Map 1-10). Mapped slide areas are deposits from large, currently inactive, rotational block type slides. There is little evidence of recent movement of these slides. Movement of these slides may have occurred in the past when precipitation was greater than it is currently. Two mapped slides, Parsnips Lakes area and the east side of Rosebud Mountain, represent typical events of movement created by a heavy overburden over moist, low strength, clayey weathered tuffs or other soft Western Cascade material. Small active slumps may occur in and adjacent to these areas. Parsnips Lakes are apparent sag ponds created by bulges blocking water flow. Springs at the base of the slide indicate an underlying relatively impervious contact. Management concerns for these areas include potential for activation of mass movement by road construction and other heavy disturbance.

Tableland and/or small plateaus include near level flats, mound-intermound surface, and clayey margins. Agate Flat and the Lincoln Airport flats are typical of this category. Mound-intermound micro-relief consists of round raised structures roughly 50 feet or less in diameter surrounded by depressions that typically hold and accumulate temporary surface water that act as vernal pools for certain plants. One theory is mound-intermounds may have formed as a periglacial features created by freezing, thawing, and "ice wedging." There is considerable evidence (Cox and Scheffer 1991) that the mounds may be formed by pocket gophers (*Thomomys bottae* and/or *Thomomys mazama*) in an effort to keep their nest and runway above the winter water levels. Mounds associated with an impervious underlayer that holds surface water typically have active gopher colonies that have been shown to maintain the mounds by the direction of soil movement. Management concerns for this area include human and livestock disturbance of vernal pool plant habitat and heavy human disturbance (ruts) in open, seasonally wet areas.

Jenny Creek Late Successional Reserve General Geology

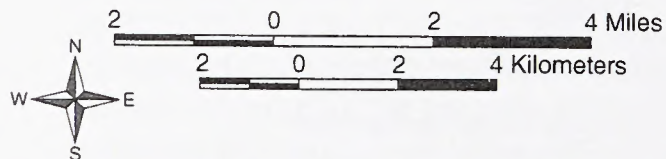
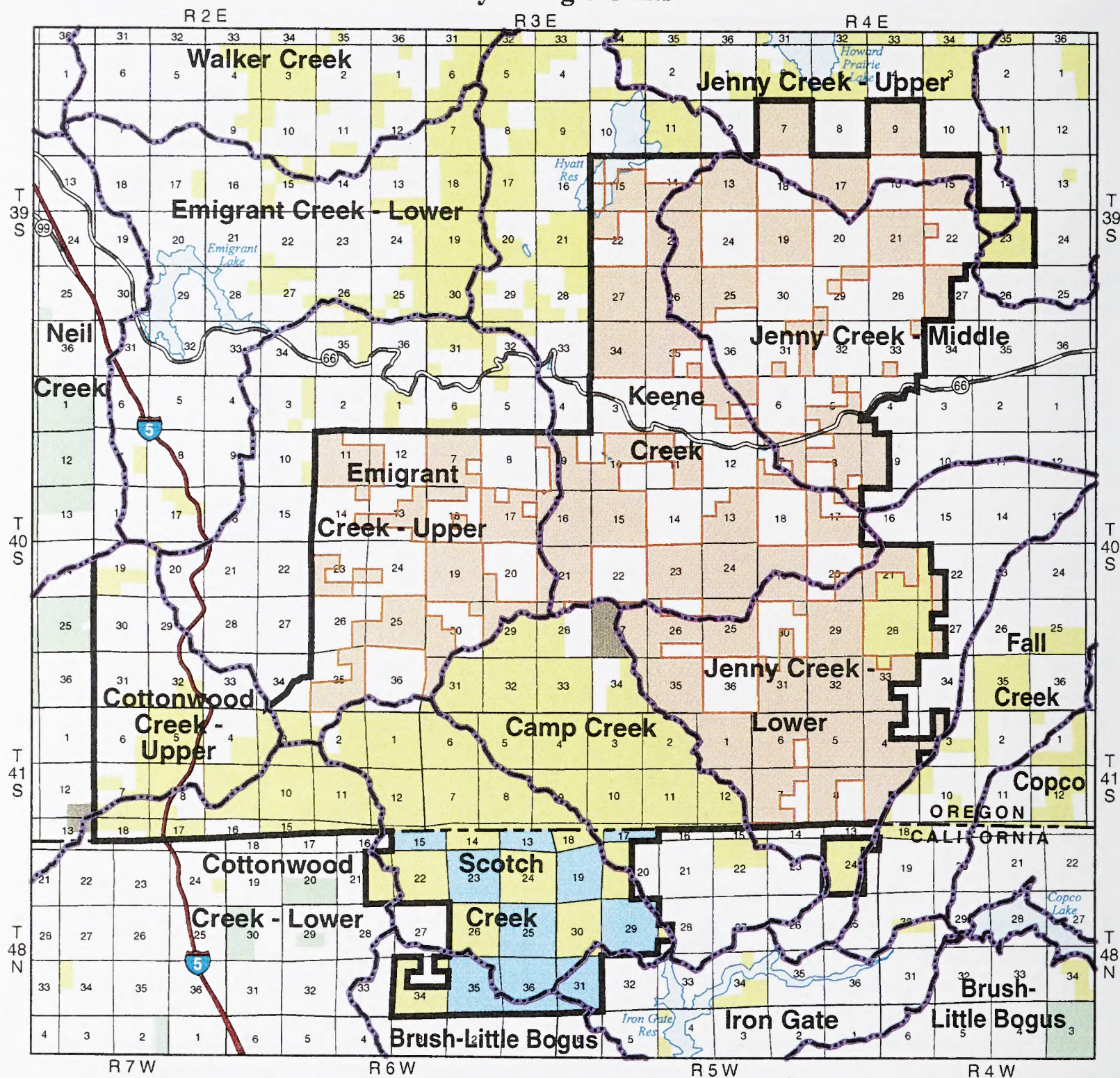


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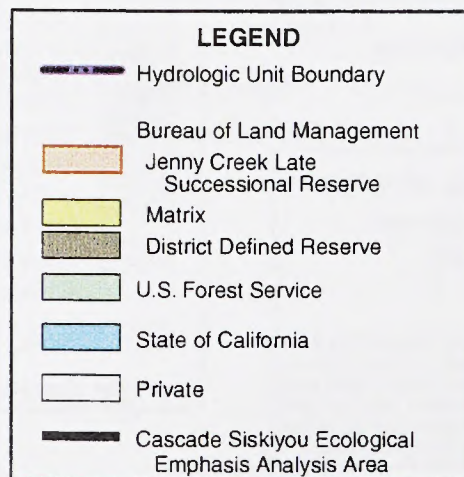
MAP 1-5

Jenny Creek Late Successional Reserve Hydrologic Units



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MAP 1-6

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Jenny Creek flows at the contact between the West Cascade and High Cascade series. Canyon walls are located on one side, typically the east High Cascade side or on both sides of the stream. The canyon walls are typically over 200 feet high with slopes of over 65 percent. The walls are indicative of a downcutting phase of stream development where the stream gradient, after the most recent High Cascade flow episode, would have to reach equilibrium. Within the canyon, various small segments exist where a later stage of deposition and narrow flood plains have developed. Beavers have been a factor in creating slow flow and therefore broadening the channel and increasing deposition. Segments where canyon walls are nonexistent are flood plain areas and bench/foot margins.

Soils

The dominant soils found in the LSR are displayed in Map 1-10 (dominant soils are given in the upper part of each map symbol and the numbers are representative soils for the mapped area). Where more than one soil commonly occurs, a primary and secondary soil unit is presented. Where different aspects for the same soil series occur, only the most common unit is represented.

Soils vary in the watershed with land form and source material. Soils on wet alluvial margins and meadows are typically Klamath (99) and Sibannic (167). These are deep, moderately dense, poorly drained soils with silty clay loam to clay subsoils. Soils series on the Western Cascades hill slopes are typically McMullin (113), McNull (114), Skookum (173), and Tatouche (190). These are well drained, moderately dense, moderately deep to deep soils with clayey subsoils (varying amounts of coarse fragments) except for McMullin, which is a shallow loamy soil. Soil patterns and landscape in this part of the area are very complex due to differing degrees of weathering of the mixed basalt/tuff/breccia of the Western Cascade material. Soils with clayey subsoil have low strength when wet, while sediment derived from these soils is fine and stays suspended for extended periods of time. These soil types are also susceptible to cutbank failures and turbid runoff.

See Appendix K for characteristics of the identified soils. Most of the soils in this area exhibit erosion rates near natural levels except where recent harvesting has occurred or roads have been built. These areas will have erosion rates above natural levels for the first three-to-five years after a disturbance. Natural surface roads and/or roads not maintained often erode above natural rates as a result of being poorly drained or rutted from use during the wet season.

Most of the soils in this LSR are productive with limitations because of high rock content and/or perched water table in the spring time. In disturbed forest stands, there is competition for water and nutrients between tree species and grass. When stands are opened up during tree harvesting, more sunlight reaches the ground and, as a result, grass species can invade the site. This often affects the microbial population of the soil (both numbers and types) and their ability to synthesize organic material into nutrients available for plant growth. A soil dominated by grass has a microbial population predominantly of bacteria, while an old-growth forest has predominantly a fungal population. A fungal dominated soil is more conducive to tree growth, as ectomycorrhizal fungi aid

trees by mediating nutrient and water uptake, protecting against pathogens and maintaining soil structure.

Hydrology-Watershed Descriptions

The Jenny Creek LSR is located primarily in the southern portion of the Jenny Creek Watershed, but also includes some upper reaches of the Bear Creek (Emigrant Creek) Watershed and a small portion of the Klamath-Iron Gate (Camp Creek) Watershed (see Maps 1-6 and 1-7). Only the Jenny Creek and Bear Creek Watersheds are discussed in detail. Jenny Creek is classified as a Tier 1 Key Watershed under the Medford District BLM RMP. As such, the Jenny Creek Watershed is considered important for the conservation of at-risk resident fish species and has a high potential of being restored as part of a watershed restoration program. Tier 1 Key Watersheds are the highest priority for watershed restoration (NFP/ROD, B-19). Based on this requirement, a significant management direction for the Jenny Creek LSR should be the restoration of the watershed.

Jenny Creek Watershed

The Jenny Creek Watershed is a very complex system with regard to hydrologic characterization. Characterization is based on climatological, hydrologic and physical data such as soils, elevation, slopes, and areas. The watershed spans an area of 134,300 acres or 210 square miles [Jenny Creek Watershed Assessment and Analysis (JCWAA) 1995]. Those portions of the watershed influenced by management within the LSR cover approximately half of that area. Elevation ranges from 2,375 feet at the mouth of the watershed to 6,565 feet along the rim in the northeast corner. Over 960 acres of stream corridor have been classified as the Jenny Creek Area of Critical Environmental Concern (ACEC). The watershed contains six distinct subwatersheds: Upper Jenny Creek, Sheepy Creek, Johnson Creek, Middle Jenny Creek, Lower Jenny Creek, and Keene Creek. Only portions of Upper Jenny Creek, Middle Jenny Creek, Lower Jenny Creek, and portions of Keene Creek are associated with the LSR. These four subwatersheds are at the level at which hydrologic and climatic assessment is best carried out.

Upper Jenny Creek Subwatershed

Upper Jenny Creek has an area of 27,611 acres or 43.1 square miles, of which approximately 2,300 acres are in the Jenny Creek LSR. It is located at the top of the watershed. Only portions of Jenny Creek, Soda Creek, and Grizzly Creek are included in the LSR. All LSR designated lands are south of Howard Prairie Reservoir. Elevations in the subwatershed range between 4,000 and 6,165 feet. Eighty-nine percent of the area rests at an elevation above 4,000 feet, and 79 percent of the area is between 4,165 and 5,365 feet. Snowpack is likely from December through February on most of the area and through March on areas above 5,365 feet. Average annual precipitation at Howard Prairie Dam is 34 inches. Average precipitation may exceed 40 inches at the highest elevations.

Howard Prairie Dam is located in the Upper Jenny Creek Subwatershed and intercepts all incoming flow above the dam. Downstream release of streamflow into Grizzly Creek (tributary to Jenny Creek) tends to occur only in years of normal or above normal precipitation. Transport ditches also

intercept flow from numerous small drainages downstream of the dam, the largest of which is Soda Creek.

Middle Jenny Creek Subwatershed

Middle Jenny Creek has an area of 22,538 acres or 35.2-square miles, of which approximately 6,355 acres are located in the Jenny Creek LSR. It is located in the middle of the watershed. Elevations range between 3,200 to 5,736 feet at Little Chinquapin Mountain. Four percent of the area rests below 4,165 feet; 58 percent between 4,165 and 5,365 feet; and 38 percent of the area is above 5,365 feet. Snowpack is likely from December through February on most of the area and through March on areas above 5,365 feet. Snowpack below 4,165 feet is most likely from December to January. Average annual precipitation is estimated at 30.1 inches. Upland vegetation on Middle Jenny Creek is characterized by mixed conifers and white fir. Average upland slopes range from 5 percent at Round Prairie to 25 percent at Little Chinquapin Mountain.

Keene Creek Subwatershed

Keene Creek has an area of 26,482 acres or 41.4 square miles, of which approximately 9,456 acres are located in the Jenny Creek LSR. It is located west of Middle Jenny Creek. Most of the lands above the Pacific Crest Trail and Hyatt Lake are not included in the LSR. Elevations in the subwatershed range between 3,200 to 6,091 feet at Soda Mountain. Fifty-one percent of the area rests between 3,200 and 4,165 feet; 47 percent between 4,165 and 5,365 feet; and 2 percent of the area is above 5,365 feet. Average annual precipitation is estimated at 33.7 inches. Upland vegetation on Keene Creek is characterized by mixed conifers and white fir. Average upland slopes range from 4 percent at Buck Prairie to 24 percent at Soda Mountain.

Dams on Hyatt Lake and Keene Creek Reservoir are part of Talent Irrigation District's (TID) irrigation system in conjunction with Howard Prairie Reservoir. Downstream release of streamflow into Keene Creek also tends to occur only in years of normal or above normal precipitation. Water collected in the TID system is routed into the Upper Bear Creek watershed.

Lower Jenny Creek Subwatershed

Lower Jenny Creek has an area of 19,306 acres or 30.2-square miles of which approximately 9,550 acres are in the Jenny Creek LSR. It is located at the bottom of the watershed. Approximately seven square miles of this subwatershed are south of the Oregon/California border, but are still within the area of influence by the LSR. Elevations in the subwatershed range between 2,375 at the mouth of Jenny Creek to 5,206 feet at the summit of Parker Mountain. Over 90 percent of the area lies between 2,965 and 4,165 feet in elevation. Average annual precipitation is estimated at 22.6 inches. Upland vegetation in Lower Jenny Creek is characterized by mixed conifers and interior valley plant communities. Average upland slopes range from less than 1 percent at Agate Flat to 24 percent at Keene Creek Ridge.

The water resource is also used for hydro power production, including a diversion on Spring Creek for a small hydro power facility at a local ranch, a diversion from Spring Creek for use by

PacifiCorp's Fall Creek Power Plant, and the capture of the remaining Jenny Creek flow at Irongate Reservoir on the Klamath River for use by PacifiCorp's Irongate hydroelectric facility.

The 1200 acre Box O Ranch is located in this subwatershed. This parcel was acquired by the Medford District BLM in 1995. A management plan has been prepared, but has not had final approval. The plan recommends against inclusion of the Ranch in the Jenny Creek LSR, primarily because most of the Ranch is in pasture, oak savannah, or brush that does not meet definitions for attaining late-successional characteristics. An estimated 90 acres have potential to meet this requirement, and, according to the draft plan, they will be managed in the same manner as surrounding LSR lands.

Upper Bear Creek-Emigrant Creek Watershed

Upper Emigrant Creek Subwatershed

Approximately 5,848 acres of the Jenny Creek LSR are in the Upper Bear Creek Watershed (Upper Emigrant Creek Subwatershed). Management activities in these designated areas could have direct influence on several tributaries, including Emigrant, Tyler, Green Mountain, Porcupine, and Baldy creeks. Influences on water quality will have farther-reaching influences downstream to the Emigrant Reservoir.

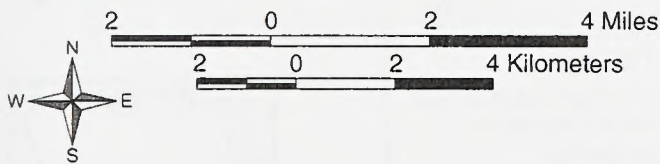
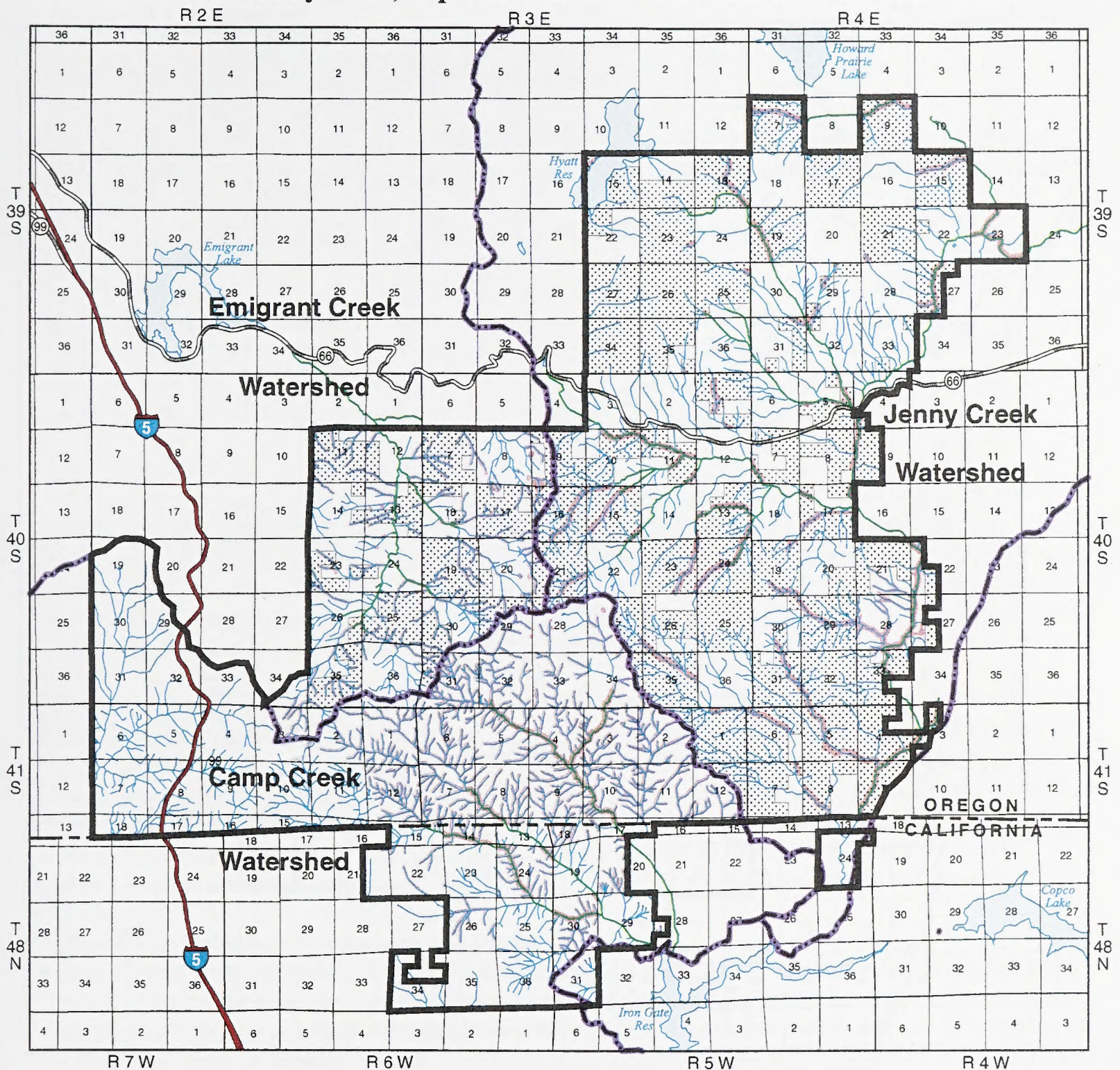
Elevations vary from 2,470 feet at the mouth of Tyler Creek to 6,091 feet on Soda Mountain. Precipitation at lower elevations is primarily in the form of rainfall, with the annual average estimated at 22 inches. Most precipitation above 5,000 feet is in the form of snow and may exceed an average of 40 inches annually. Upland vegetation at lower elevations of these drainages consists of oak woodland/open meadow matrices giving way to hardwood/mixed conifer communities. Upper elevations have upland plant communities dominated by mixed conifers with white fir most prevalent at the highest elevations.

Water captured from the Upper Jenny Creek and Keene subwatersheds is routed into a pipe at Keene Creek Reservoir. The water passes into a penstock that drops the flow to a small hydroelectric facility located on Emigrant Creek. From there, the water flows into Emigrant Reservoir.

Camp Creek Watershed

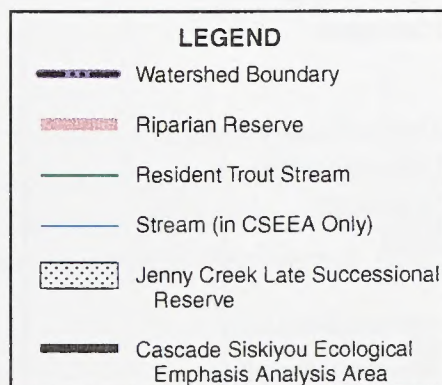
Only a small percentage of the LSR, 989 acres, is located in the Camp Creek drainage, primarily around Soda Mountain and the headwaters of Right Fork Camp Creek. Elevations in the watershed range from 4,800 feet at Soda Mountain to 3,200 feet at the Oregon/California border. Precipitation data was not available.

Jenny Creek Late Successional Reserve Stream Systems, Riparian Reserves and Fish Distribution



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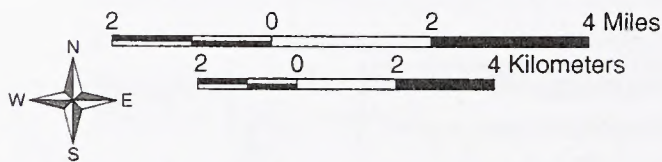
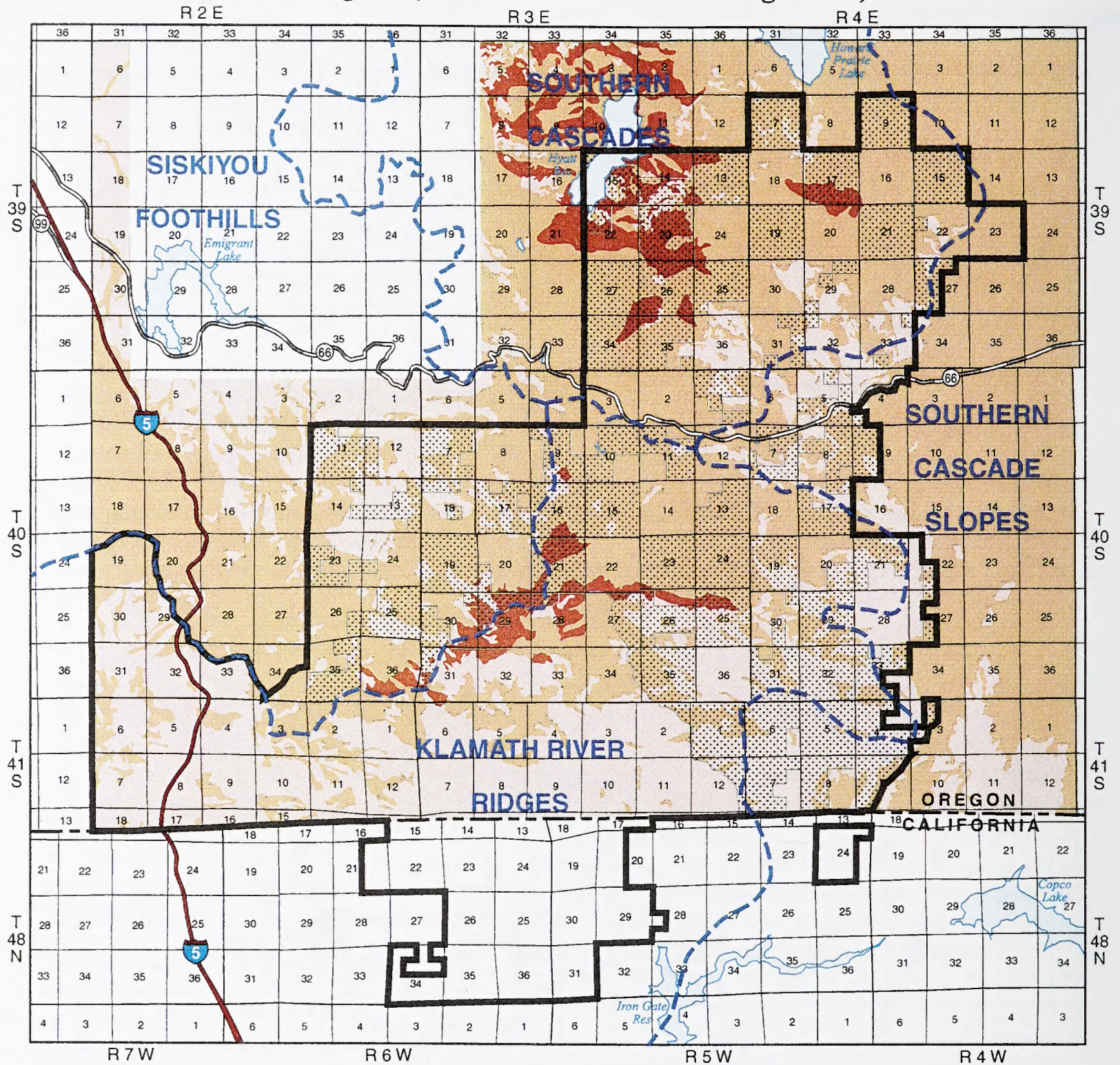
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MAP 1-7

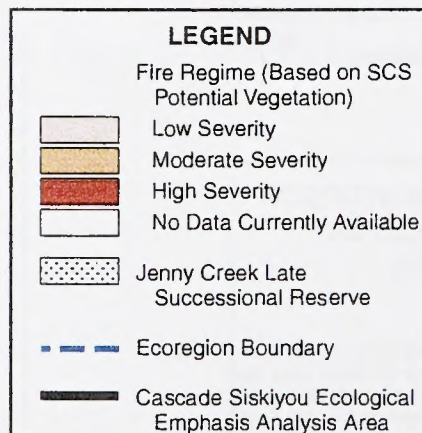
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Jenny Creek Late Successional Reserve Fire Regime (Based on SCS Potential Vegetation)



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MAP 1-8

Fire Regimes and Wildfire History

Fire is recognized as a key natural disturbance process throughout southwest Oregon (Atzet and Wheeler 1982). Climate and topography combine to create the type of fire regime found throughout the LSR.

Fire Regimes

Fire regime is a broad term and is described as the frequency, severity and extent of fires occurring in an area (Agee, 1990). Vegetation types are helpful in delineating different fire regimes and the dominant vegetation types are the basis for fire regime delineation. Three broad fire regimes within the LSR were identified and their locations are displayed in Map 1-8.

Low-Severity/Frequent Occurrence Regime

This regime is characterized by vegetation types such as grasslands, shrublands, hardwoods and mixed hardwood, and pine. These plant communities are adapted to recover rapidly from fire and are directly or indirectly dependent on fire for their continued persistence. Approximately 29 percent of the LSR falls into this category. A low-severity regime is characterized by nearly continual summer drought; fires are frequent (1-25 years), burn with low intensity, and are widespread. The dominant trees within this regime are adapted to resist fire due to the thick bark they develop at a young age.

Moderate-Severity/Less Frequent Occurrence Regime

This regime is associated with the mixed coniferous vegetation type. Approximately 51 percent of the LSR is categorized in this regime. This regime is characterized by long summer dry periods; fires are frequent (25-100 years). This regime is the most difficult to characterize and is often located in a transitional position between low and high elevation forests. Fires burn with different degrees of intensity within this regime. Stand replacement fires as well as low intensity fires will occur depending on burning conditions. The overall effect of fire on the landscape is a mosaic burn.

High-Severity/Infrequent Occurrence Regime

This regime is characterized by the white fir vegetation type. This environment is characterized by moist, cool conditions; fires are infrequent. Accurate fire return intervals have not been calculated because of the long intervals between fires (100+ years). When fires occur, they are due to unusual conditions, such as drought periods associated with high winds. Fires are normally stand replacement fires. Approximately 20 percent of the LSR is categorized in this fire regime.

Fire History

Lightning and human-caused fires have been a source of disturbance to the landscape for thousands of years. Fire has played an important role in influencing successional processes. Large fires were a common occurrence in the area based on fire scars and vegetative patterns and were of varying severities. Native Americans influenced vegetation patterns for over a thousand years by igniting

fires to enhance values that were important to their culture (Pullen 1995). Early settlers to this area used fire to improve grazing and farming and to expose rock and soil for mining.

The fire history data of the respective ecoregions illustrate the number of severe intensity fires from 1660 to 1900 (Figure 1-1). Fire scars on trees create a long term record of wildfire (Figure 1-2). Fire history for the South Cascade Slopes Ecoregion was not detectable due to the low severity, frequent fires that occurred in the chaparral, scablands, and meadow communities found there.)

In the early 1900s, uncontrolled fires were considered to be detrimental to forests. Suppression of fires became a major goal of land management agencies and by the 1920s, due in part to an increase in suppression forces, attempts were made to extinguish all fires. From the 1950s to present, suppression of all fires in this area became proficient. As a result, there has been a build-up of unnatural fuel loadings and a change in vegetative conditions and these altered conditions have changed fire cycles from the low-severity to moderate- and high-severity fire regime areas. Although forests of all ecoregions experience frequent fires, stand developmental data indicates many trees survived. This would indicate that fires were of low intensity. These unrestrained fires burned through the forests periodically, reshaping the forests with every event. With fire as an important ecological process, only species with compatible reproductive systems were able to persist on the landscape, creating forest ecosystems that are not only adapted to low-severity/frequent occurrence wildfire, but are dependent on it.

Therefore, as a result of fire suppression, forests composition and fuel loading have changed and many ecological processes that sustained historic forest productivity and ability to persist through low-severity/frequent fire have been modified. These new forests have become altered rendering them vulnerable to insect infestations, disease, and catastrophic fire.

High density forests burn with increased intensity because of the unnaturally high fuel levels and can damage soils and often completely destroy riparian vegetation. Historically, low intensity fires often spared riparian areas, while providing desired wildlife habitat structures, see Figure 1-3.

Frequent low- intensity fires served as a thinning mechanism by naturally regulating the density of the forests, that is, killing susceptible and small trees. Ponderosa pine trees which generally thrive in fire prone environments now face increased competition from more shade tolerant conifer species that invade and establish in the absence of fire. As a result, some late-successional forests in the Jenny Creek LSR have undergone a transition from ponderosa pine dominated stands to stands now dominated by true firs.

In the dry forest locations many of the seedling and pole size dominated forests lack density management provided by low-severity/frequent fires and will fail to grow into large trees characteristic of old-growth forests. Trees facing intense competition often become weakened and susceptible to insect epidemics and tree pathogens. Younger trees (mostly conifers) also contribute to

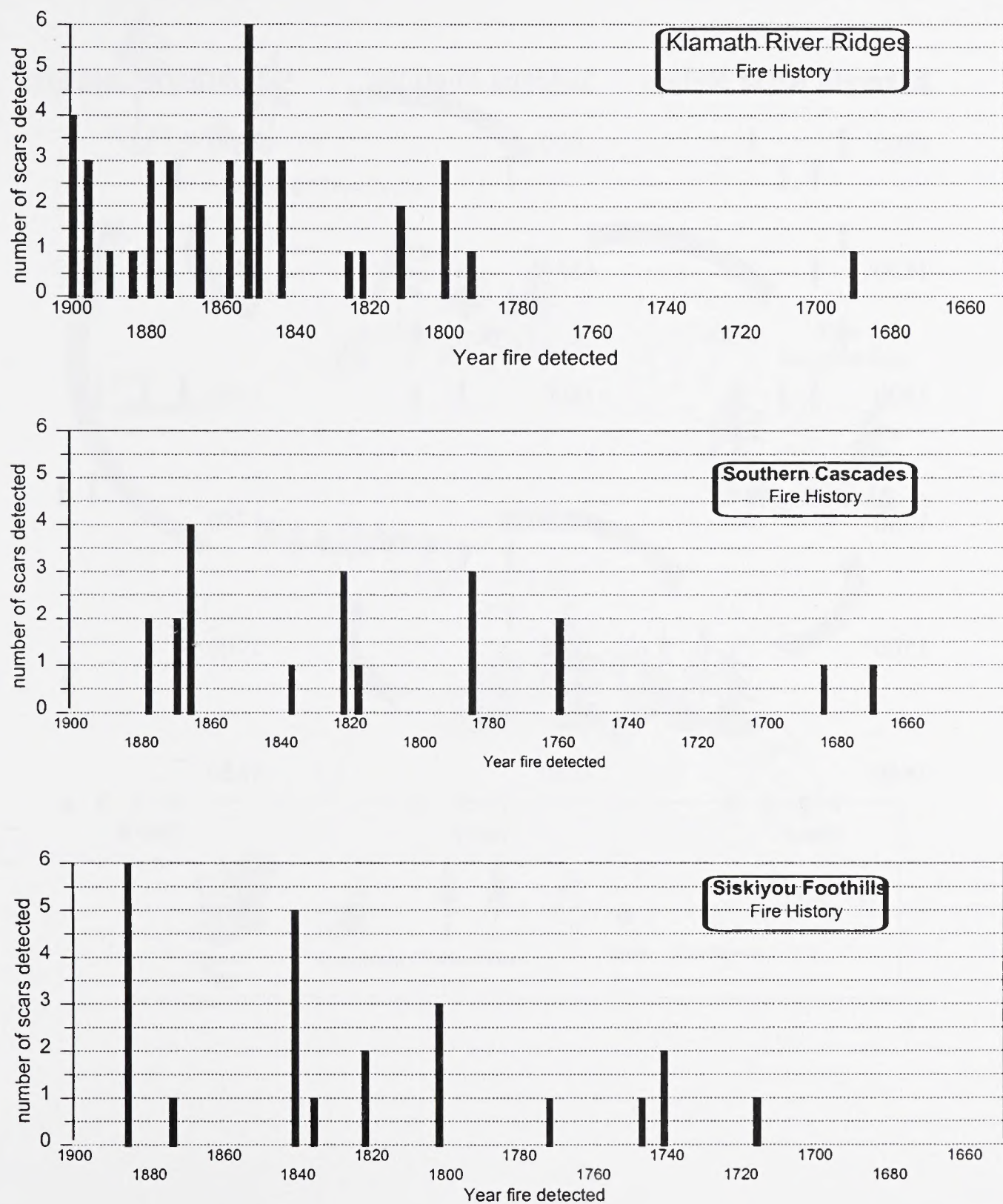
Figure 1-1. Jenny Creek LSR ecoregion fire histories (# of fires detected by year)

Figure 1-2. Jenny Creek LSR ecoregion fire frequency history (individual trees with scars, year fire was detected)

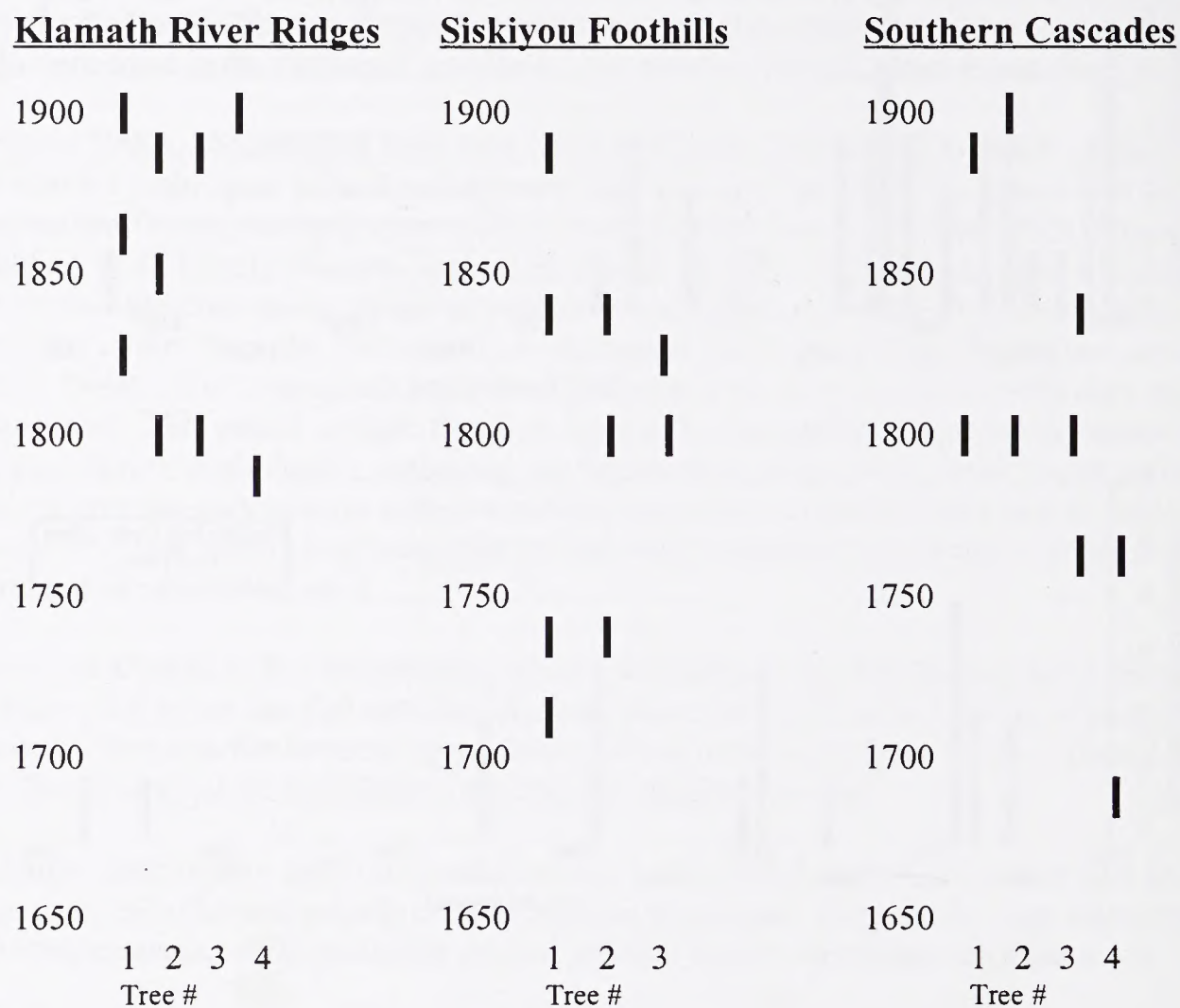
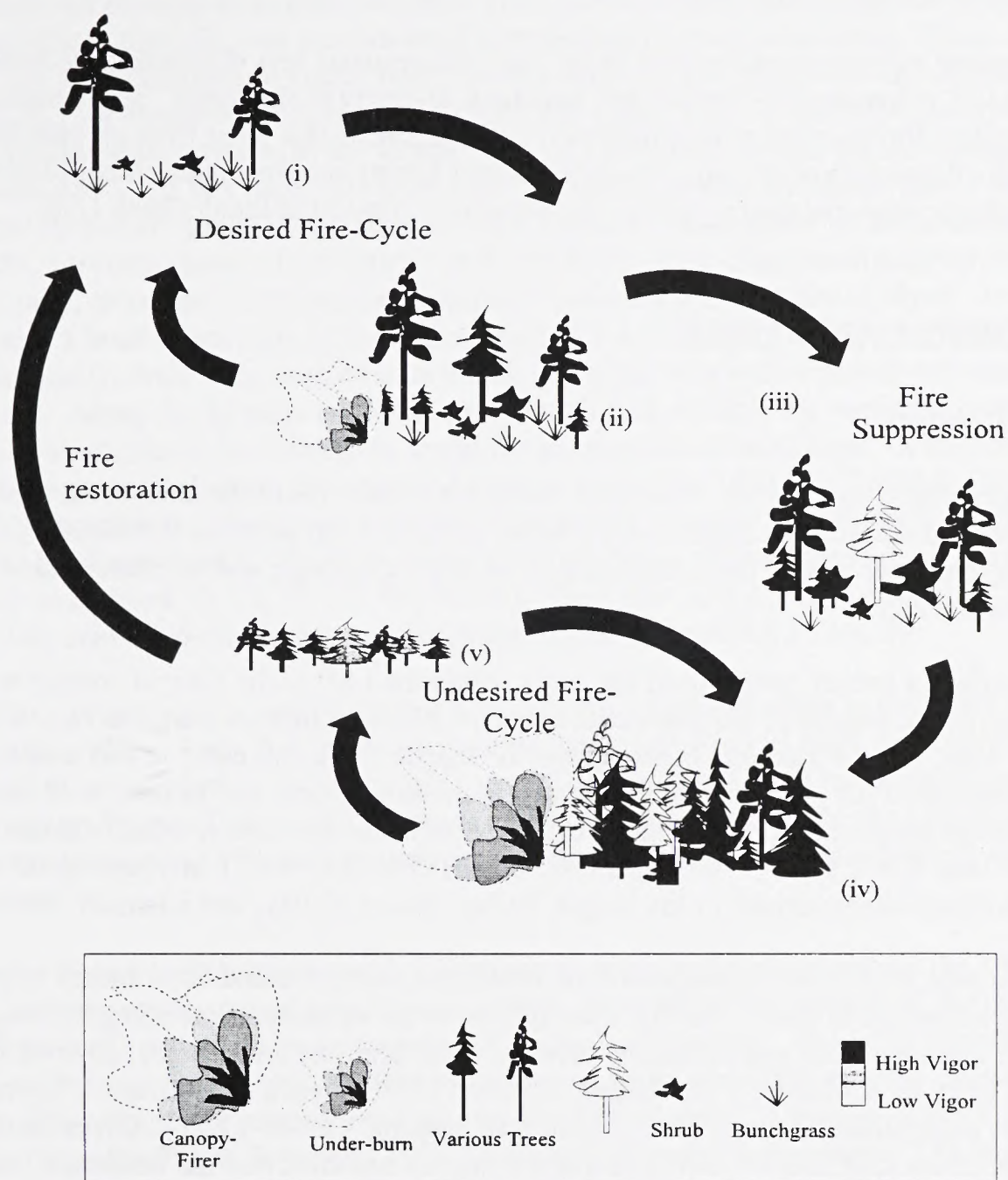


Figure 1-3. Desired and Undesired Fire-Cycles



stress and mortality of mature conifers and hardwoods stand components. Consequently, much less late-successional habitat will develop and there likely would be diminished habitat for populations of late-successional associated species.

Trees growing at lower densities tend to be more fire-resistant and vigorous. Eventually they grow large and tall, enhancing the vertical and structural diversity of the forest. Some populations of organisms that thrive in the more structurally diverse forests that large trees provide are becoming threatened. Protection of existing late-successional forests and the management of younger forests toward late-successional characteristics are objectives within the Jenny Creek LSR.

HISTORIC LAND USES

Native Peoples

Numerous archaeological sites, relating to American Indian use of the area, occur within the LSR. These sites and artifacts document use by native peoples for at least the last 10,000 years. Sites are especially abundant around the upland meadows, glades, springs, and marshes, which characterize the ecology of the area.

Several different Indian groups used the lands within the LSR at the time of contact with Euro-Americans in the middle of the nineteenth century. Klamath Indians from the east, Shasta Indians from the west, and the Takelma Indians from the Rogue Valley all came to this area during the warmer months of the year to hunt, gather vegetable foods, trade, and to meet with each other for various social purposes. Archaeological evidence indicates this pattern of upland use stretches back in time at least 6,000 years (Winthrop 1996; Mack 1996; Gray 1993); archaeological sites often contain artifacts characteristic of the Rogue Valley, Shasta Valley, and Klamath Basin.

Native peoples were active managers of the landscape, using fire and other means to promote those resources important to them. Historic descriptions of the uplands surrounding the Rogue Valley indicate a landscape that was extremely diverse, with "prairies, brush fields, downed logs, and open stands of pine, fir, and cedar". According to Pullen (1996), "such a landscape is typical of areas that have been manipulated through Native American burning" (1996: VI-11). Given the long-term and heavy use of the LSR area by native peoples, it may be assumed that the landscape was subjected to manipulation for thousands of years. Native use of fire enhanced and maintained the prairies, glades, meadows, and brush fields, which were an important part of the diverse and patchy environment valued by the native peoples.

By the end of the 1850s, the native peoples were killed, confined to reservations, removed from the surrounding valleys, or died of introduced diseases. Native use of the uplands ceased at this time, as did their centuries of land management.

Early Historic Land Uses (1846 - c. 1900)

Early government surveys done after the removal of native peoples note numerous meadows and prairies throughout the LSR, and provide brief descriptions of other vegetation. These surveys offer a glimpse of the landscape before major modifications occurred due to historic uses. In the eastern half of T.40S.R.2E., surveyors note "open pine, fir, oak and cedar" (1857). In 1859, surveyors record numerous meadows and prairies in the western part of T39S/R4E, though the mountains are not surveyed until 1894. At this time, surveyors note "scattering timber and dense brush" in sections 20, 21, with "heavy timber" to the north (sections 16, 17) and a "rocky glade" to the south (sections 28, 29). In 1859, surveyors note "Hiatt Prairie" in T.39S.R.3E., with other small prairies to the east and "timber fir, pine, cedar, etc. with undergrowth [sic]" covering the land east of Hyatt. In 1871, surveyors give a brief description of the eastern part of T.41S.R.3E.: "The eastern half of the township is mostly...bald hills covered with bunch grass and very well-watered with springs and small streams. Along the streams are found many small flats suitable for horticulture having good soil. Timber is not plenty, but enough is found for all purposes of settlement. It has the appearance of having been extensively used for grazing for many years." In 1873, for T.40S.R.4E., surveyors describe the township as "...timbered with the finest quality of sugar and yellow pine, fir, cedar, and oak...". The 1894 survey of T.40S.R.3E. notes areas of "heavy timber" throughout the township (specifically in sections 19, 22, 27, 31, 32, 25, 36). They also note a "brushy opening" in sections 16 and 17, and an area of "dense brush and scattering timber" in sections 28 and 29.

The first Euro-Americans came through this area seeking a southern route to the prime farmlands of the Willamette Valley. Jesse Applegate opened the Applegate Trail in 1846, and travelers through the area used this route during the following years. The Applegate Trail route was improved as the Southern Oregon Wagon Trail in 1872, bringing a slow influx of settlers to the LSR area. A post-office was established in 1878, near present day Pinehurst, serving local ranches and early homesteaders.

Settlers in the Rogue Valley began seeking summer pastures in these uplands by the 1860s. Livestock grazing was the major use of these uplands for much of the last half of the nineteenth century. Both cattle and sheep ranged through these upland pastures. The latter decades of the nineteenth century witnessed uncontrolled expansion of sheep and cattle grazing, provoking continual "bickerings and wranglings" among rival grazers for the best range. Creation of the Forest Reserves in 1893, and later the Forest Service in 1907, brought some order to the range. The lands within the LSR were part of the Cascade Range Forest Reserve in the early decades of the twentieth century, and as such were part of a vast grazing and hunting preserve used mainly by local settlers.

Sheep pastured with cattle in the high mountain meadows of the Cascades, and did well. The woolen mills at Ashland prospered until the 1930's, when they succumbed to the sharp drop in wool prices, which accompanied the Depression.

Like the Indians before them, these local ranchers and settlers often set fire to large areas to promote the growth of berries, browse for game, and forage for their stock. Sometimes these fires swept through the areas of heavy timber; it seems the fire management of the historic settlers was less discriminate than the practices of their Indian predecessors. Records of the Cascade Range Forest Reserve from 1900 note conditions in the area by township; these records indicate that fire had a significant effect on the vegetation in the LSR, and also contain brief descriptions of the extant timber (Leiberg 1900):

T.39S.R.3E.: "...The forest contains a large quantity of red fir [Douglas-fir], small in growth and badly damaged by the numerous fires which have "overrun the township in recent times. The yellow pine is short bodied, as is the usual condition on the rocky areas of this region. Where fires have burned all the timber, brush growths are the rule." 6,900 acres are listed as burned clean or badly burned, with 19,140 forested acres.

T.39S.R.4E.: "...Fires have run throughout the entire extent of the township. The northern areas are very badly burned, extensive tracts being completely covered with brush growth as a result. The central and southern portions carry a heavy forest of yellow pine, excellent in quality and easy of access. The red fir is inferior in growth and quality, due to the many fires in the region." 6,000 acres are listed as burned or badly burned, with 18,000 forested acres.

T.40S.R.2E.: "...Fires have run through the forest in recent times, burning 30 percent of the timber and badly searing the remainder. The stands are light and scattered among bare, rocky flats and glades and dense brush growths. The larger portion of the timber consists of small-growth red fir of little commercial value." 9,300 acres are listed as burned or badly burned, with 13,540 acres forested.

T.40S.R.3E.: "...It is a very broken region, with the forest mostly burned up long ago and in its place dense brush growths or here and there grassed-over slopes...The mill timber is of small growth and of little value." 13,400 acres are listed as burned or badly burned, with 12,040 acres forested.

T.40S.R.4E.: "...The mill timber in the eastern sections forms heavy stands, is excellent quality, and easy of access. Fires have marked the entire forest stand in the township, and have mostly suppressed the young growth; hence the forest is of an open character, with but little undergrowth.". 19,740 acres are listed as forested; no figures are given for burned or badly burned areas.

Logging was not a significant activity in the LSR prior to 1900. The Cascade Range notes (Leiberg 1900) list only 1,200 acres as logged, and all of that in T.40S.R.2E. Difficult access limited exploitation of the timber resources of the LSR during the nineteenth century. Significantly, the only township with any logging was located nearest to the railroad, which connected the Rogue Valley to urban markets in the north and south in the 1880s.

Grazing/Range Land History

With the exception of timber production and related road construction, historical livestock grazing practices have been a contributing factor to the present vegetation species within the Jenny Creek LSR boundaries. Prior to the Forest Reserve Act of 1893 and the Taylor Grazing Act of 1934, there was no control over the uses of the Federal lands.

Stock raising became an important part of the Rogue River Valley economy in the early 1850s. Increasing populations as a result of the discovery of gold in 1851 created a high demand for red meat (BLM 1978). With increased demand the ranchers began to utilize the excellent ranges in Klamath County. Thousands of cattle were driven over the Cascades in the 1860s and 1870s to the developing cattle empires in Eastern Oregon. Sheep raising became important in the late 1800s. Sheep pastured with cattle in the high mountain meadows of the Cascades and the Dead Indian Plateau from 1890 until 1940. Historical records from the Rogue River forest indicate that several thousand head of sheep and cattle ran on the Keene Creek range. The Barron Brothers ran large sheep camps from about 1900 to 1917. Crane Prairie, within the Jenny Creek LSR boundary, was a major camp (USDA 1953). Cattle numbers increased after 1940 as sheep were phased out with the drop in wool prices during the Depression. In addition to sheep and cattle, hundreds of horses historically ran out year around. Severe overgrazing was reported in the upper Rogue Valley. In 1913, the Dead Indian Plateau was reported to be the most extensively grazed district on the Crater National Forest (Minore 1978).

Local cattlemen formed associations to coordinate use of the rangelands among both the livestock operators and the agencies. The Keene Creek Cattle and Horse Association was formed in 1917 and included 30 permittees on Forest Service lands. The Pilot Rock Grazing District was organized in 1934 by resident stockmen from Southern Oregon and Northern California. Conflict between members resulted in the formation of the Greensprings Cattlemen's Association (Oregon) and the Camp Creek Cattlemen's Association (California) in 1952. Hamilton Fox refused to join the associations and was issued a separate lease on what is now the Jenny Creek allotment. Extensive bits of the history related to area livestock operations are contained in the files of both the BLM and Forest Service.

Twentieth Century Uses

The advent of the railroad opened the area to timber exploitation. Soon after the turn of the century, major lumber companies such as Weyerhaeuser made their appearance in the area; in 1905, Weyerhaeuser bought a large tract of land along Jenny Creek. Homestead laws and the construction of the Greensprings Highway in the 1920s brought more settlers to the uplands, with development concentrated along current Highway 66. Many residents came as ranchers, but other "homesteaders" were hired by large and small lumber companies to acquire sections of land, which later were turned over to the companies.

Ranching and logging--still important uses in the LSR--were the major land use activities in the early twentieth century. The federal government continued to manage vast tracts of land, and concern about overgrazing and destructive fires focused the attention of the federal government on grazing regulations and fire suppression. Grazing regulations as, well as fire suppression practices, helped control over-grazing and wildfire, and contributed to vegetation changes in the following decades.

Recreational uses of the area, for hunting, hiking, fishing, also began in the late nineteenth century and expanded in the twentieth, especially with the improvement of roads through the area. The 1920s witnessed the growth of local communities; the town of Lincoln was founded around a mill established in 1929.

The Depression era of the 1930s hit both loggers and ranchers hard. Sharp drops in the prices of commodities made sheep and timber unproductive, and hurt the cattle industry as well. The mill at Lincoln stopped running for several years, and sheep disappeared from the LSR.

World War II brought a demand for timber and with it a renewal of the logging industry in the region. The mill at Lincoln was busy again, as were others in the area. Ranching continued to be a major use. Opening of the land through logging, along with grass-seeding programs, improved the range but changed the character of the native vegetation. An active range program was instituted by the BLM, which had become the primary government manager.

The 1970s saw a change in which the larger companies came to dominate the lumber industry, trucking trees to larger mills outside the area, as the small mills closed one-by-one. As property came on the market, more and more new purchasers arrived from cities outside the area, looking for an escape from the urban lifestyle. The attitudes of these emigrants often reflected these urban values, which placed less emphasis on commodity production and more value on the environmental setting.

Ranching and logging were the first historic occupations and still constitute major economic uses of the watershed lands. People have been drawn to the area for hundreds of years by hunting, fishing, and pleasant summer weather. Today, winter sports add a new dimension to the recreational use of this area.

SPECIAL MANAGEMENT AREAS

The Jenny Creek LSR contains five special management areas or portions thereof: the Cascade/Siskiyou Ecological Emphasis Area (CSEEA), the Soda Mountain Wilderness Study Area (WSA), the Oregon Gulch Research Natural Area (RNA), the Jenny Creek Area of Critical Environmental Concern (ACEC), and the Pacific Crest National Scenic Trail (PCNST). See Map 1-9 for location of special management areas within the Jenny Creek LSR.

The CSEEA includes a portion of the Jenny Creek LSR from State Route 66 south to Soda Mountain along both sides of the Hobart Bluff Ridge east to Jenny Creek and south to the California border and west to the Mariposa Lily and wildlife area west of Interstate 5, Exit 1. Late-Successional reserve lands in Tyler Creek and north of Route 66 are generally excluded from the CSEEA.

Cascade/Siskiyou Ecological Emphasis Area (CSEEA)

The CSEEA plan (ROD 1995) provides for management of a number of floristically rich vegetation types, two RNAs, two ACECs, the PCNST, that portion of the Jenny Creek LSR included in the area, special status plant and animal populations, crucial deer range for the interstate deer herd, and the outstanding recreation, scenic, and scientific values of the area. Off-highway vehicle (OHV) use in the WSA will be managed according to Interim Management Policy. OHV use in the remainder of the CSEEA will be limited to designated roads. Timber harvest will be deferred until 2005 pending completion of a management plan. Research and monitoring will be initiated to help develop management options to maintain the ecosystems of the area. Coordination in California will occur with the Redding BLM on the Jenny Creek ACEC and the Horseshoe Ranch Wildlife Area (Redding BLM and California Department of Fish and Game), which is contiguous with the CSEEA in Oregon. CSEEA will be a part of a quality management area that includes the majority of the Dead Indian Plateau, which is under BLM administration. Here greater emphasis will be placed on innovative social processes as a tool for achieving resource objectives through applied stewardship.

Oregon Gulch Research Natural Area (RNA)

The 1,047-acre Oregon Gulch RNA (Map 1-8) was set aside for scientific research and baseline studies of its mixed conifer forest and manzanita-ceanothus/bunch grass chaparral communities. The Oregon Natural Heritage Program (Natural Heritage Advisory Council 1998) list the RNA as partially covering the white fir cell. Several sensitive plant species (Bellinger meadowfoam, Greene's mariposa lily, and Howell false-caraway) are found there. The RNA is not available for timber harvest, is closed to OHV use, is closed to mineral entry, and mineral leasing is subject to NSO.

Jenny Creek Area of Critical Environmental Concern (ACEC)

The Jenny Creek ACEC (2-24) covers 966 acres of Jenny Creek in a long narrow broken ownership that alternates between private and public lands in eight parcels with two on Keene Creek and one in the BLM Redding District. The ACEC was established to protect and prevent irreparable damage to the stream's natural system, riparian values, special status fish, and other special status plants and animals. The ACEC is not available for timber harvest. OHV use is restricted to established roads. Mineral leasing is subject to NSO. Land acquisition is needed to carry out the objectives of the ACEC.

The Jenny Creek LSR is one of the most recreationally-diverse areas in the entire Medford District. Within this LSR are the Hyatt-Howard Special Recreation Management Area (SRMA), the Pacific Crest National Scenic Trail (PCNST), the Applegate National Historic Trail, a small portion of the Soda Mountain Wilderness Study Area (WSA), a larger portion of the Oregon High Desert Protection Act (OHDPA) proposed Soda Mountain Wilderness, the proposed Hyatt-Howard Back Country Byway, and Jenny Creek itself, which was found eligible for Wild and Scenic River status, but was not found suitable for inclusion in the National Wild and Scenic Rivers system.

Hyatt-Howard Special Recreation Management Area

Approximately 17,800 acres of the 42,000 acre Hyatt-Howard Special Recreation Management Area (SRMA) is within the LSR. Recreational activities within the SRMA include: fishing, swimming, boating, hunting, camping, hiking, equestrian activities, mountain biking, OHV activities, sightseeing/driving, wildlife viewing, mushroom and berry gathering, cross-country skiing, snowmobiling, ice-skating, and sledding/tubing. Landscape features that contribute to the recreational potential of the SRMA include the lake and the location along the Cascade crest.

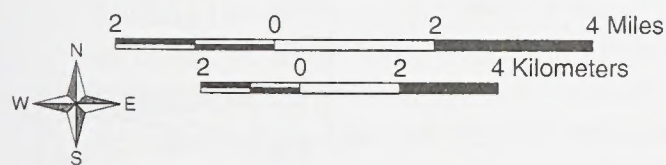
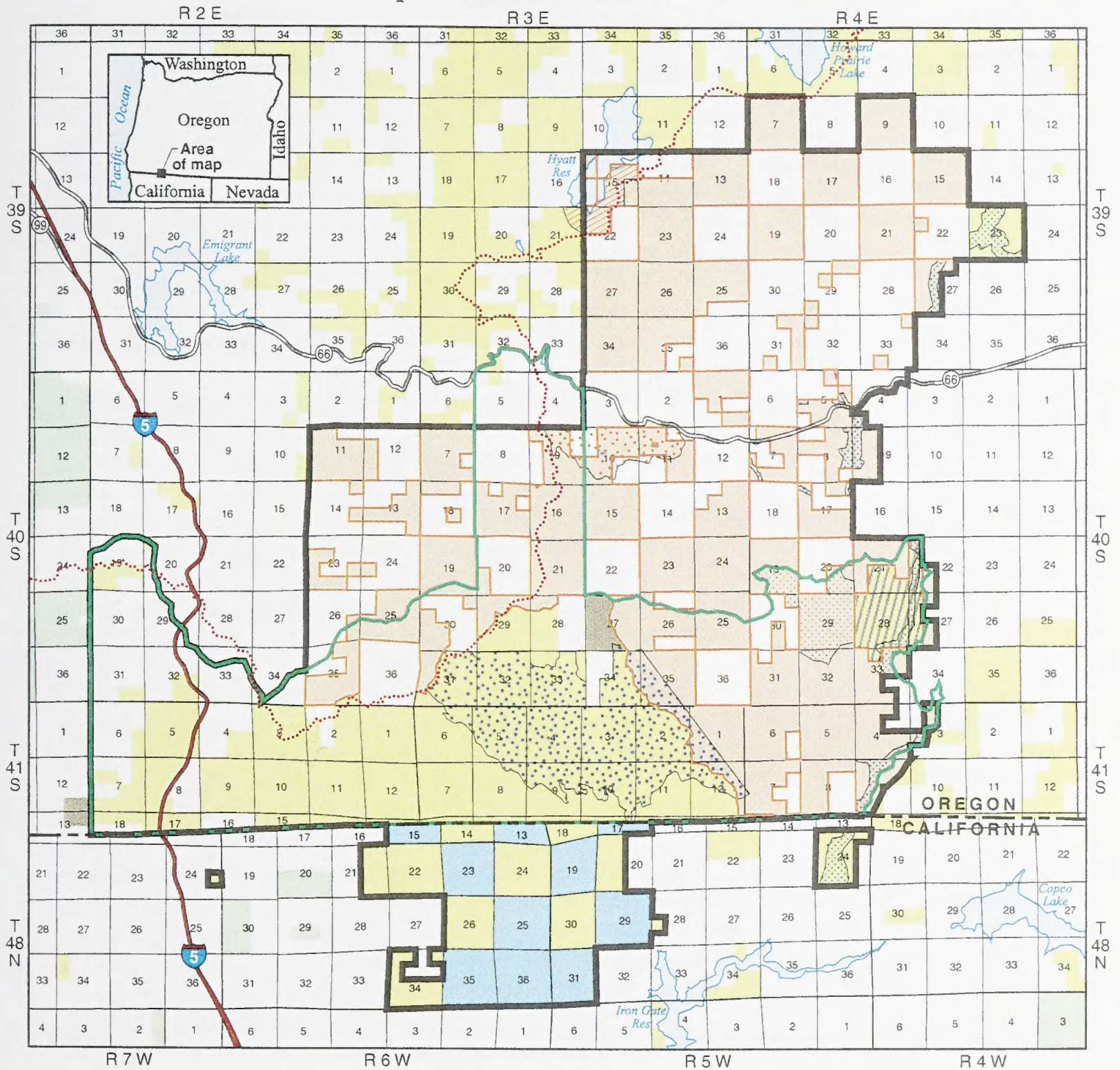
Recreational facilities within the SRMA and within the LSR include: private resorts, developed campgrounds, semi-primitive campgrounds, a winter play area, and a BLM watchable wildlife site. Facilities around Hyatt Lake are privately managed or managed by BLM.

Important recreational issues within the SRMA include: visual resource management, inappropriate or competing recreational demands for the resource, grazing, winter access, and management along the PCNST.

Pacific Crest National Scenic Trail

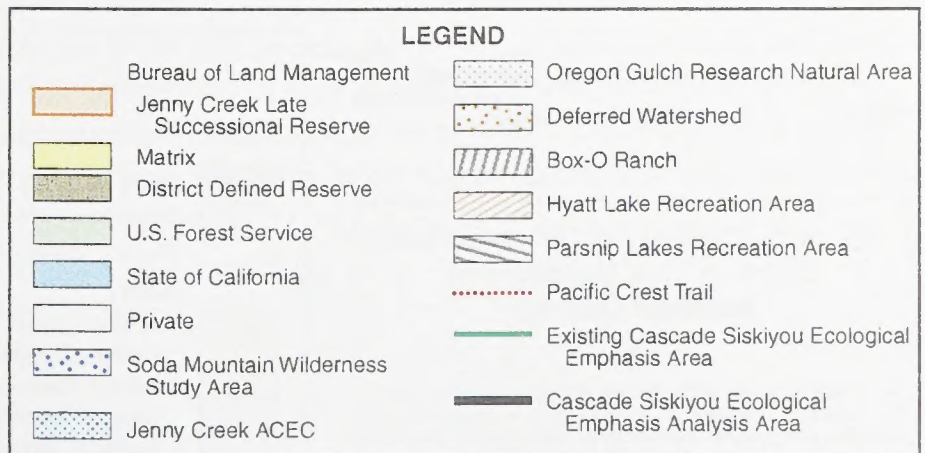
Approximately 12 miles of the Pacific Crest National Scenic Trail (PCNST) traverse the LSR in the vicinity of Hyatt Lake and Hobart Bluff Ridge. Under the RMP, the lands for .25 mile on each side of the trail are managed as Visual Resource Management (VRM) Class II. The PCNST is open to hiking and pack animals, but is closed to motorized vehicles and mechanized vehicles, including mountain bikes. Camping facilities are available at the Hyatt Lake Campground for PCNST users and water sources are available near Greensprings Mountain and at Griffin Pass.

Jenny Creek Late Successional Reserve Special Areas in the JCLSR



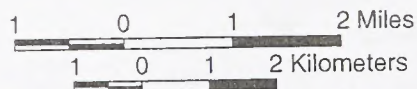
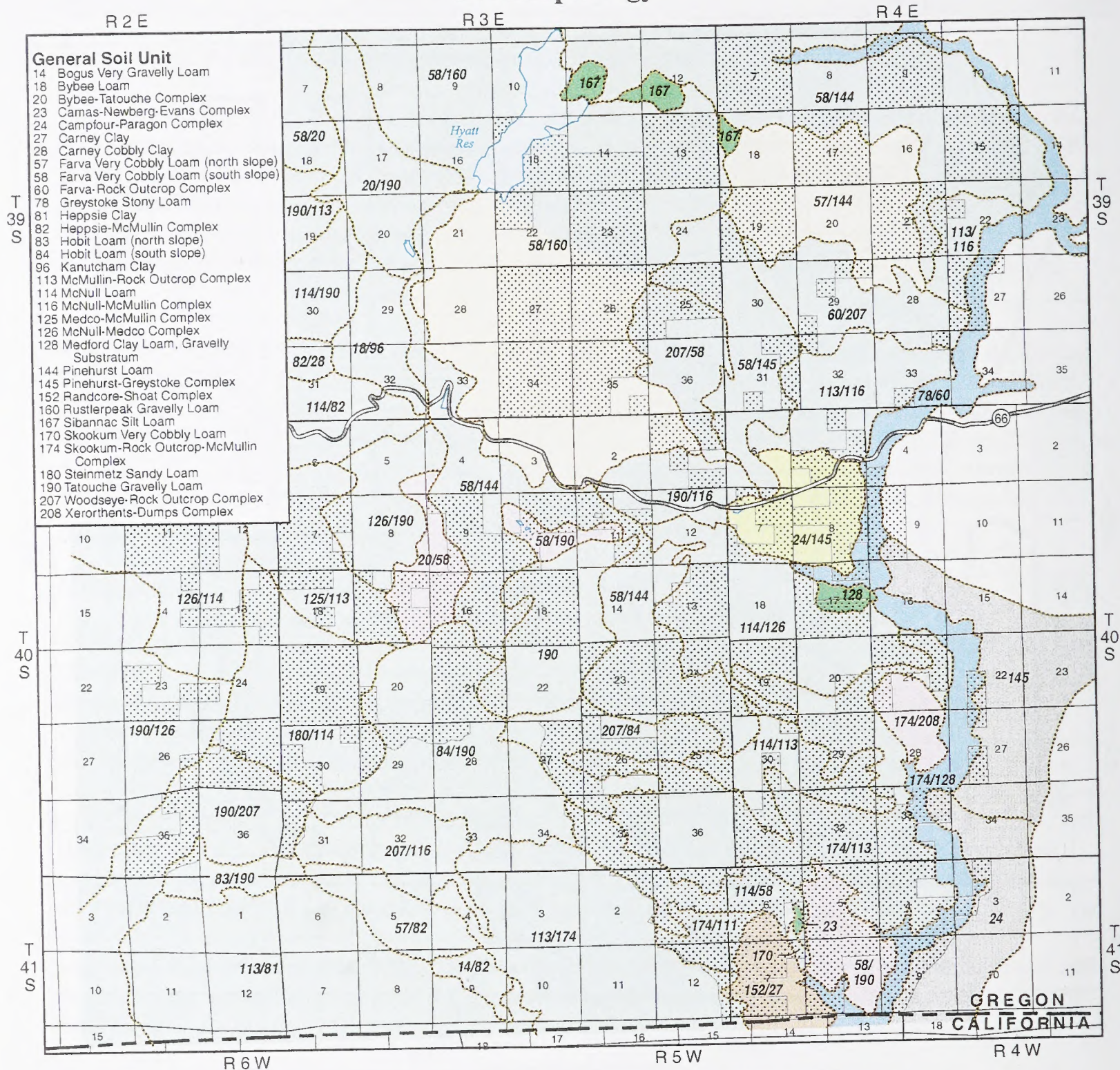
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MAP 1-9

Jenny Creek Late Successional Reserve Geomorphology



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LEGEND

- Soil Unit Boundary
- 180/114 Soil Conservation Service Number (primary/secondary)
- Alluvial
- Pleistocene - Pliocene Flow
- Pliocene Shield Volcano
- Tertiary
 - Western Cascade (Table Land)
 - Western Cascade (Plateau)
 - Western Cascade (Slide Material)
 - Western Cascade (Canyon)
 - Western Cascade
- Jenny Creek Late Successional Reserve



MAP 1-10

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Applegate Trail

The Applegate Trail, a portion of the California National Historic Trail designated in 1992, traverses the watershed from Greensprings summit to Grouse Butte following much of what is now Highway 66. Important issues associated with the Applegate Trail include its preservation and interpretation. Existing and potential conflicts include surface-disturbing activities that might disturb archaeological sites associated with the trail.

Soda Mountain Wilderness Study Area

The Soda Mountain Wilderness Study Area (WSA) is a 5,867-acre roadless area on the south side of Soda Mountain. Approximately 800 acres of the WSA is within the Jenny Creek LSR. Recreational activities within the WSA include: hiking, horseback riding, and hunting.

Important issues associated with the WSA include: the boundary, fire management, OHV incursions, and non-native species. Existing and potential conflicts include the OHDPA proposal for a 32,000-acre wilderness, vehicle restrictions proposed for the WSA and surrounding lands, and grazing. The OHDPA proposal includes additional lands inside and outside the Jenny Creek LSR. Approximately 6,300 acres of the OHDPA proposal are within the LSR, including numerous private parcels.

Seasonal vehicle restrictions are proposed for the Agate Flat, Keene Ridge area, including approximately 13-square miles of land within the Jenny Creek Watershed. These restrictions are proposed to prevent damage to the area when the roads are wet. Attempts at gating an access road near Pilot Rock in 1993 failed, and the long history of vehicular access to the area will make enforcement of the closure difficult.

Outside of the recreation areas listed above, dispersed recreation activities include: hunting, fishing, camping, OHV use, hiking, snowmobiling and skiing, sightseeing, and horseback riding. Issues involving dispersed recreation include: length of stay limits, fire closures, and fish and game issues. Existing and potential conflicts occur when people stay longer than allowed or leave trash in the woods. Conflicts also occur when Oregon Department of Forestry closes the public lands to all users and hunters refuse to obey the closure.

During the RMP planning process, Jenny Creek, from its confluence with Grizzly Creek down-stream to Irongate Reservoir, was found eligible for Wild and Scenic River status based on fish and historic values. When the stream was evaluated for suitability, it was determined that Wild and Scenic designation would not be recommended because of fragmented ownership. Once the RMP was finalized and the ROD was signed, any protection afforded Jenny Creek under the Wild and Scenic Rivers Act or Department policies was removed.

Jenny Creek LSR Assessment Team Members

Team Members	Responsibility
Dave Russell	Team Leader , Silviculture & Monitoring
Matt Broyles	Wildlife
Greg Chandler	Fire and Fuels
Bill Haight	Hydrology, Aquatics, and Fisheries
Ted Hass	Soil, Geology and Writer/Editor
Dr. Paul Hosten	Vegetation and Woodlands Ecology
Tom Jacobs and Billie Nicpon	Range
Dr. Frank Lang	Botany
Jan Miller	Lands
John Samuelson	Transportation
Tom Sensenig	Silvicultural Ecology
Mark Steiger	Survey and Manage Plant Species
Fred Tomlins	Recreation
Kenny McDaniel	Project Manager
Larry Zowada	GIS

CHAPTER 2

EXISTING CONDITIONS

ECOREGIONS/PHYSIOGRAPHIC PROVINCES

The Jenny Creek LSR is located at the juncture of three NFP physiographic provinces: OR Western Cascades, OR Eastern Cascades, and the OR Klamath physiographic provinces (NFP/ROD A-3). Being located at the intersection of the Cascade Mountains and the Klamath Mountains there is considerable variation in physiographic characteristics. The Oregon Natural Heritage Program (ONHP) in its 1998 plan to conserve Oregon's natural heritage and protect its biodiversity adopted an ecoregion concept. These ONHP Ecoregions are described by several ecological factors or characteristics and each ecoregion is designated by a geographic name and number. The ONHP Ecoregions are used in this LSR assessment to define important biophysical relationships.

The Jenny Creek LSR overlaps portions of three Level III Ecoregions: Klamath Mountains (78), Cascades (4), and Eastern Cascades Slopes and Foothills (9) (Pater et al. 1997a and 1997b and Natural Heritage Advisory Council 1998), see Map 2-1. These Level III Ecoregions are further subdivided into subordinate Level IV Ecoregions which in the ONHP classification system uses the Level III number plus a lower case letter to distinguish each Level IV Ecoregion. There are four Level IV Ecoregions found in the Jenny Creek LSR: Southern Cascades (4g), Southern Cascades Slopes (9i), Siskiyou Foothills (78b) and Klamath River Ridges (78g), see Map 2-2.

Ecoregion Characteristics

Ecoregions are defined by a number of factors that include: physiography (including elevation and local relief), geology (surficial material and bedrock), soil (order, common soil series, temperature and moisture regimes), climate (mean annual precipitation, mean annual frost free days, mean January and July min/max temperature), potential natural vegetation, land use (recreation, forestry, watershed), and land cover (vegetation present). The following synopsis is based on Pater (1997a and 1997b). The ONHP plan lists important ecosystem cells by name and specifies the entity that protects them. [Note: In the Jenny Creek LSR, the Bureau's Oregon Gulch RNA represents a mixed conifer cell, not a white fir cell, as stated in the ONHP plan.] See Table 2-1 and Map 2-1 for Jenny Creek LSR Ecoregion IV locations and acreages.

Southern Cascades (4g)

The Southern Cascades Ecoregion (2,600-5,800 feet) in the southern portion of the Oregon Cascades is drier than the rest of the Cascades (4). It is characterized by gently sloping mountains, broad valleys, a long summer drought, and high vegetation diversity. White fir (*Abies concolor*) is common; at low elevations, Douglas-fir (*Pseudotsuga menziesii*) and ponderosa pine (*Pinus ponderosa*) become prevalent. Compared to the other ecoregions in the Jenny Creek LSR, the South

Cascades Ecoregion contains more white fir climax plant communities and the highest percentage of LSOG/NSO NRF habitat.

Southern Cascade Slopes (9i)

The Southern Cascade Slope Ecoregion (3,600-6,300 feet) is a transitional zone between the Cascades (4) and the drier Eastern Cascade Slopes and Foothills (9). Forests of ponderosa pine blanket the mountainous landscape; white fir, and Douglas-fir grow at higher elevations. Much of the Southern Cascade Slope Ecoregion typically receives more precipitation than other Level IV Eastern Cascade Slopes and Foothills Ecoregions. The South Cascade Slope Ecoregion within the Jenny Creek LSR tends to be predominantly gently sloping ponderosa pine dominated landscapes which had historically more open canopies than at present. Meadows and grasslands are often found associated with forest stands.

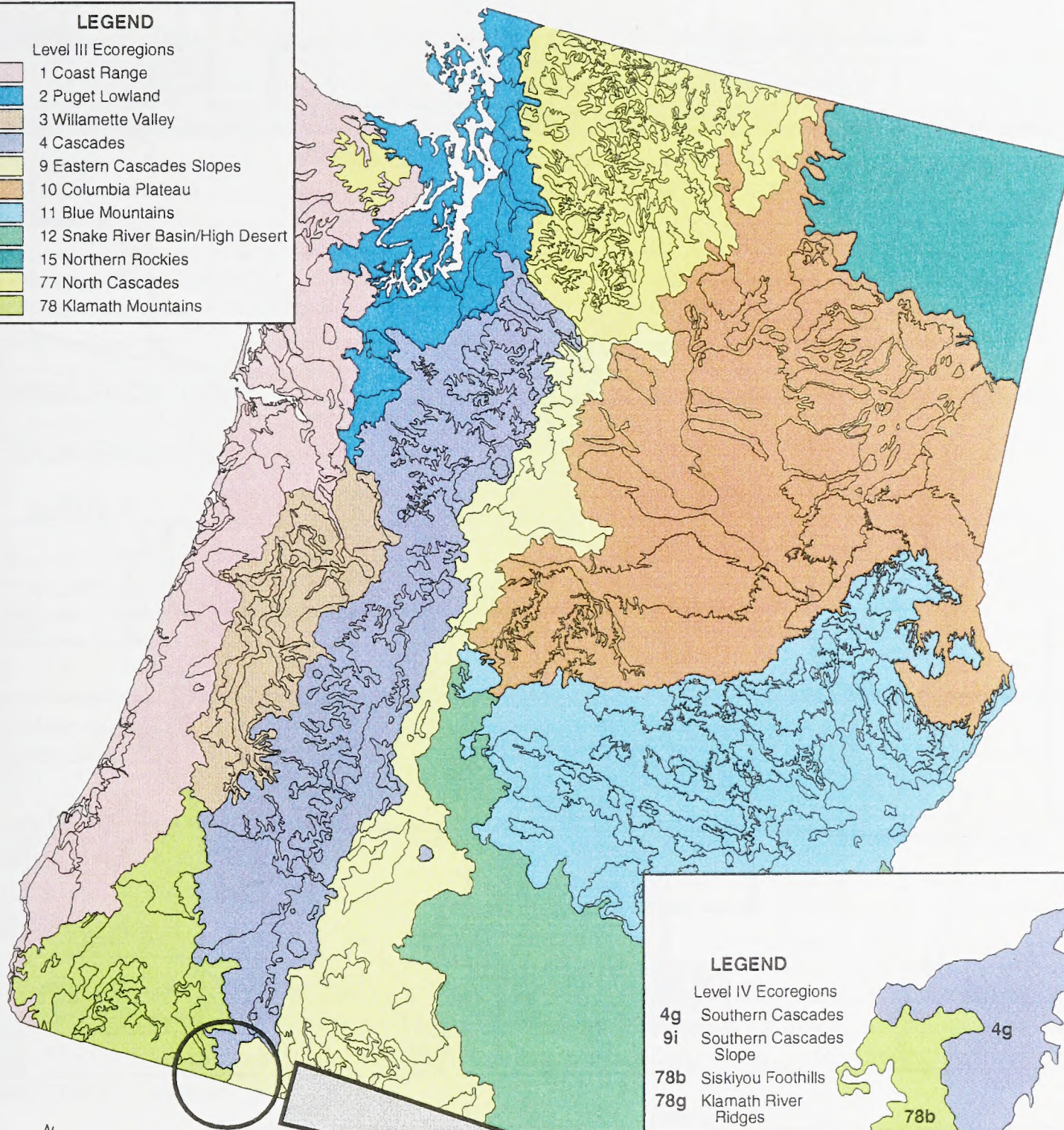
Siskiyou Foothills (78b)

The Siskiyou Foothills Ecoregion (1,500-4,000 feet) is affected by a Mediterranean climate similar to that of the Rogue Valley. The driest area occurs east of Medford and is dominated by oak woodlands, ponderosa pine, and Douglas-fir. This ecoregion is the western most and lowest in elevation. Few white fir are present. Pacific Madrone is a common hardwood component of the forest in this ecoregion while generally absent from the other ecoregions of the Jenny creek LSR.

Klamath River Ridges (78g)

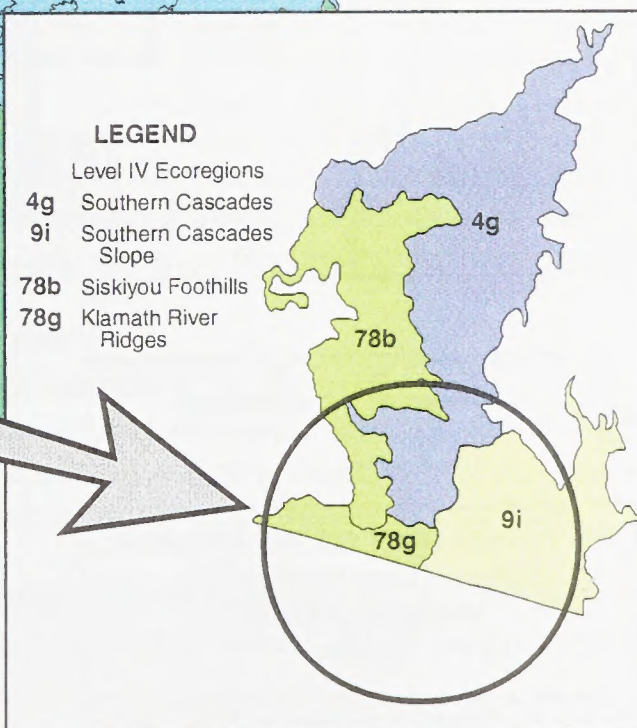
The Klamath River Ridges Ecoregion (3,800-7,000 feet) has a dry continental climate and receives on average 25 to 35 inches of annual precipitation. Low elevation and south-facing slopes have a more drought resistant vegetation than elsewhere in the Klamath Ecoregion (78), such as juniper, chaparral, and ponderosa pine. Mid-elevation forests are composed of sugar and ponderosa pine as well as incense cedar and Douglas-fir. Higher and north-facing ridges are covered by Douglas-fir, and white fir. A significant portion of the Klamath River Ridges in the Jenny Creek LSR does not have the potential capacity to become NSO suitable habitat because it is comprised of low elevation, south facing slopes.

Jenny Creek Late Successional Reserve Ecoregions of Oregon and Washington



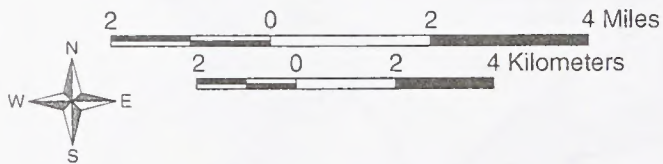
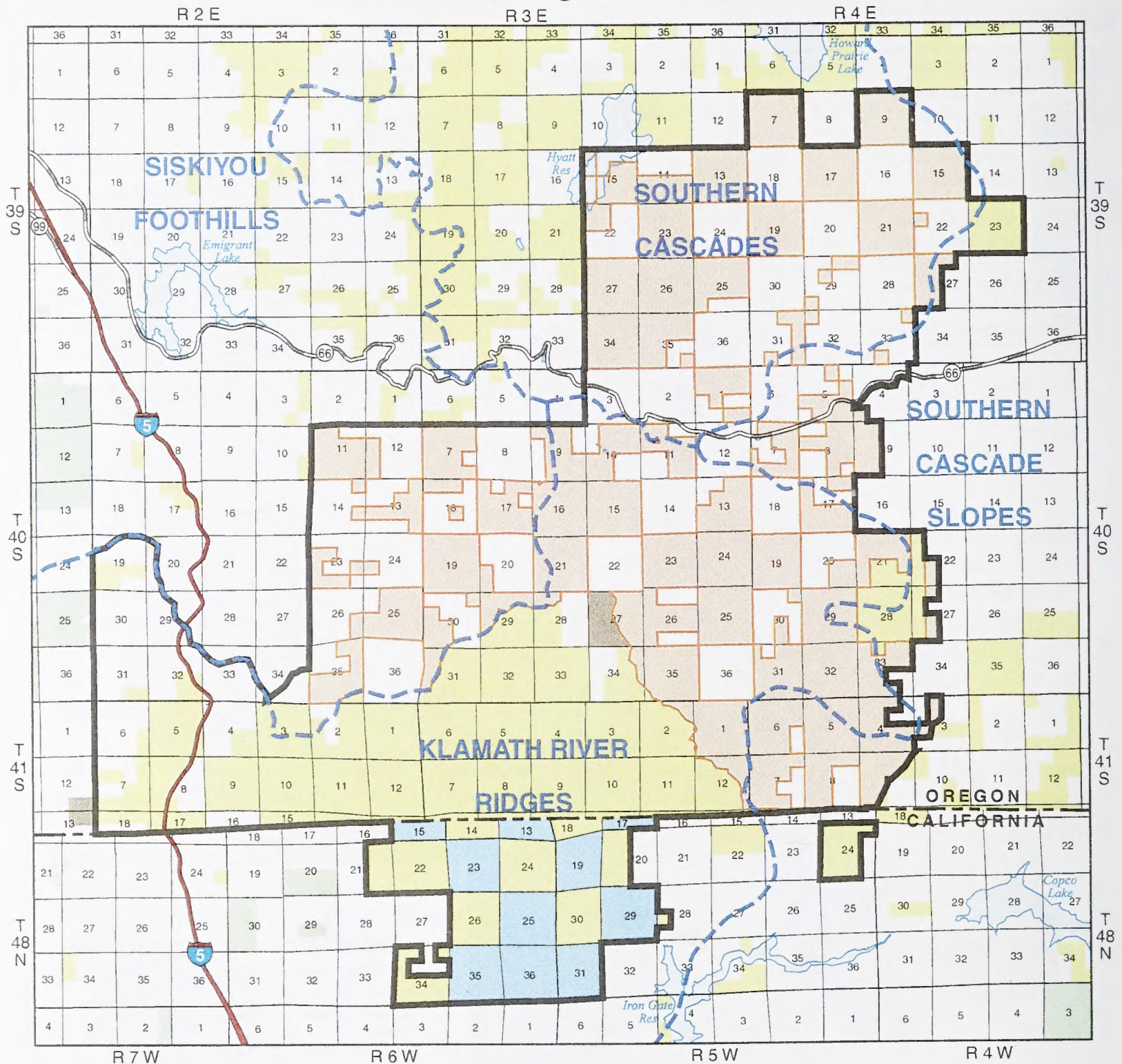
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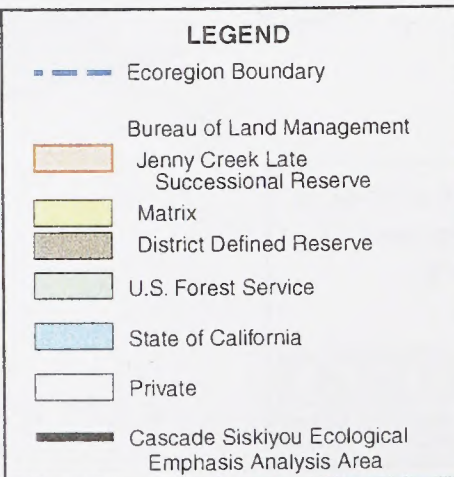
MAP 2-1

Jenny Creek Late Successional Reserve Ecoregions



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MAP 2-2

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Table 2-1. Jenny Creek LSR Ecoregions IV (ONHP) locations and acreages

Ecoregion Level IV (ONHP) <i>Physiographic Provinces (NFP/ROD)</i>	Location of Ecoregion, Watershed Tributary Flow and Special Areas	BLM Acreage <i>LSR percentage</i>
Southern Cascades (4g) <i>Southern portion of OR Western Cascades</i>	Northern area of LSR. Between Howard Prairie Reservoir to the Greensprings Highway and Hyatt Lake Road and Jenny Creek. Tributaries flow east to Jenny Creek. Hyatt Lake Recreation Area	10,219 30%
Siskiyou Foothills (78b) <i>Eastern boundary of OR Klamath</i>	Western area of LSR. Upper Emigrant Creek drainage northwest of the Pilot Rock and north of Soda Mountain. Tributaries flow north to Bear Creek and Rogue River. Cascade Siskiyou Ecological Area.	5,779 17%
Klamath River Ridges (78g) <i>Eastern boundary of OR Klamath and southern boundary of OR Cascades</i>	Southern portion of LSR. South of Greensprings Highway to Soda Mountain, northern slopes of the Keene Creek drainage to the Oregon and California state line. Tributaries flow east to Jenny Creek and Klamath River. Cascade Siskiyou Ecological Area, Oregon Gulch RNA, Parsnip Lakes and adjacent to Soda Mountain Wilderness Study Area.	12,417 37%
Southern Cascade Slopes (9i) <i>Western and southern boundary of OR Eastern Cascades</i>	Eastern portion of LSR. Steep canyon slopes along Jenny Creek and the low elevation alluvial fans associated with Jenny Creek. Tributaries flow south into Jenny Creek and Klamath River. Jenny Creek Recreational Area.	5,591 16%
Jenny Creek LSR BLM Acreage	<i>Total Gross Acreage all ownerships is 66,743ac</i>	34,007

SPECIAL VALUES

Biodiversity

The Jenny Creek LSR lies in an area of high biodiversity because of its location at the intersection of several different floristic provinces. Plants from the major ecoregions mentioned above meet and thrive in the LSR because of the variety of habitats provided by variation in climate, geology, soils, aspect, and elevation.

The value of biodiversity is important in scientific ways that may be of benefit to humanity in general. The study of individual species can provide measures for environmental quality when population size fluctuates. Individual species of all kinds, common and rare, might provide a cancer cure or allow the study of the extinction process or allow for the study of evolutionary processes.

Esthetically biodiversity enhances the appeal of plants. The greater the diversity, the greater the opportunity for beauty, uniqueness, and interesting questions of natural history. Most people respond

positively to attractive plants. Rare species attract attention because they are rare. There is value to biodiversity, which should be maintained and enhanced.

Connectivity

Connectivity is a measure of the extent to which conditions among habitat, in this case specifically LSOG, can provide for breeding, feeding, dispersal, and movement of a species (LSOG-associated wildlife, fish and plant species). The ability of a species to disperse, survive, and reproduce are interrelated to its persistence.

Jenny Creek LSR is part of a larger network of LSRs in the Oregon Cascades, Siskiyou and Northern California Cascades and located at one of two connectivity "hotspots" in Oregon (the other is Galesville LSR) providing a vegetative link for NSO to move from the Oregon Cascades to the Oregon and California Siskiyou Provinces (see Map 1-1). The Oregon Cascades to the Oregon Siskiyou link, South Cascades LSR to the Mount Ashland LSR, appears to be the stronger vegetational link than the Oregon Cascades to California Cascades, South Cascades LSR to Goosenest LSR, when habitat of either late-seral conifer stages are examined. The baseline vegetation (Table 2-2) and NSO habitat type (Table 2-5) data are used as a reasonable representations of what connectivity exists on the ground.

Drainage patterns, riparian areas, and streams (Map 1-7) provide landscape linkage within the LSR for fish, mammals and amphibians within the LSR but on a landscape vegetative basis provide migration pathways generally in a north-south from higher elevations to interior valley conditions and human developed land uses.

Allocating an area as a LSR does not automatically transform the area into functional habitat for the array of plant and animal species associated with the habitat for which the reserve was designated. Fragmentation of the LSOG habitat within the LSRs has produced breaks in habitat that can be larger than some species are willing to cross. Enhancing connectivity and avoiding further degradation of connectivity on federal lands within the LSR is a priority in improving the functioning of the LSR.

The ability to assess the effect of connectivity habitat on the specific persistence of terrestrial species is limited by incomplete information for most wildlife species on dispersal capabilities, genetic interactions, and demographic parameters that influence successful dispersal of a species. Despite the lack of definitions and lack of tools and data to assess connectivity, the ability of a landscape to provide for species movement between refugia is a persistent concern in addressing the function of a reserve system and this LSR.

Plant community habitat has changed and will continue to change over time. Whittaker (1961) considered the "central significance" of the Klamath region regarding the vegetation history of the Pacific coast states. The vegetation of the Klamath Mountains essentially took on its present character by the Pliocene (Whittaker 1961). The role that the ridges of the Klamath River ecosystem played in the migrations to this point is not clear. These Miocene and Oligocene features may or may not have

been at their present position or elevation. Post Pleistocene chaparral formation in southwestern Oregon indicate ridges of the Siskiyou Mountains acted as a barrier to northward plant migration during the period of warming and drying climate 4,000 to 8,000 years ago. California chaparral moved northward to the Willamette Valley, crossing the Siskiyou Mountains at their lowest points in Josephine County. Chaparral migrated into the Klamath basin by way of the Shasta Valley. His conclusions were based on the floristic constitution and climatic requirements of the vegetation type (Detling 1961).

It is probable that the present "relict" plants, such as quaking aspen, sagebrush, and western juniper arrived to the west by migrating along the Klamath River, then ascended in elevation during the warming and drying period of the Pleistocene. There is little evidence that the LSR or Soda Mountain - Pilot Rock ridge has ever played a major role in the east-west plant and animal migration although it does provide a relatively undisturbed east-west corridor for local animal movement, with the exception of the Interstate Highway.

For the NSO it is clear that the LSR NSO population is not isolated from NSOs in the Matrix. It is also clear that there is genetic exchange with populations to the north, east and west which is facilitated by the Jenny Creek LSR. In one notable case, a bird banded as a fledgling near Ruch, Oregon was recaptured in the LSR as a breeding adult. This bird moved 35 miles into the LSR. The route this individual took is unknown. There is no documented movement in either direction (east/west) across the I-5 corridor near the Siskiyou Pass/ Pilot Rock area.

During the mid 1980's through the mid 1990's, there was a NSO demographic study in the Ashland Watershed/Mount Ashland area. This study conducted by USFS and Oregon State University (OSU) included capturing and banding NSOs. No movement between the study area and the LSR was documented. This apparent lack of movement across the Soda Mountain/Pilot Rock/Mount Ashland ridge line is of some concern because this area is one of the few places where there is relatively intact habitat linking the populations in Klamath and Cascade mountains. If the exchange of genetic material, in the long term, does not occur in this vicinity, the probability of it occurring at all is low.

There is no documented movement to or from the LSRs in northern California. This lack of evidence of movement could be due to the fact that the Klamath and Rogue River National Forests have not been banding and recapturing NSOs as a regular program, although both forests have done some limited banding as part of research projects. Fruit Growers Corporation (Hilt, California) is a major land owner in the northern part of Siskiyou County California and has been banding NSOs on their lands for several years. There have been no reports of Ashland Resource Area NSOs turning up on Fruit Growers land or vice versa.

Special/Unique Habitats

A number of special or unique habitats occur in the LSR, which include: cliffs, seeps, springs, and meadows. The importance of cliffs and meadows to several species have been described in the discussion of special status species.

Meadows

Meadows are scattered sparsely throughout the LSR and vary greatly in size and vegetative characteristics. Vegetative characteristics are generally a function of the amount of moisture present (wet meadows vs. dry grasslands) and the degree they have been altered by grazing, recreational activities, or management actions. Under the Forest Plan, meadows are to receive special protection where they occur in areas occupied by great gray owls. Meadows are managed for prey habitat unless a special status species inhabits the site. Western blue birds, great gray owls, deer, and elk all require a certain percentage of open habitat in the landscape. As the percentage of open, early seral habitat on federal lands decreases due to the lack of clearcutting under the LSR designation, the importance of these natural meadow areas will increase.

As grazing was regulated and fires excluded or suppressed rapidly, the trend has been for meadows to decrease in size as the forest encroaches into them. This trend can be noted when comparing the 1850 General Land Office maps with the 1954 series topographic maps. The same meadow from the 1850 map covers less area in 1954 and even less today. This loss of meadow habitat through vegetative succession and conifer encroachment is likely to continue under the LSR designation on BLM land unless there is a concerted effort to restore and maintain the existing meadows.

Cliffs

Cliffs are concentrated in lower Jenny Creek canyon, outside the LSR; however, some smaller rimrock areas occur in the LSR. The cliffs present in the LSR have not been altered to any extent by past management actions.

Springs and Seeps

Springs and seeps are present throughout the LSR. There has not been any intensive inventory of these habitat types. Many springs and seeps have been degraded by grazing, recreational activity, and various management activities. Under the Aquatic Conservation Strategy in the Northwest Forest Plan, these habitats receive protection. These wet areas are often habitat for rare, and in some cases unique invertebrate organisms, such as special status slugs, land snails, and aquatic snails. This is especially true for the Jenny Creek drainage, which is known for its high level of endemism in both vertebrate and invertebrate wildlife and fish.

VEGETATION

Site Capability

The Forest Operations Inventory (FOI) indicates that 89 percent of the LSR acreage is forested land (see FOI discussion below). A subsequent inventory for current and potential NSO habitat suitability found approximately 62 percent of the LSR acreage is capable of supporting dense (greater than 60

canopy closure) LSOG coniferous and conifer-hardwood forest habitat (see NSO habitat type discussion below). That information indicates approximately 27 percent of the forested lands are of too poor a site quality, generally on south and west aspects, to support LSOG habitat. Those areas capable of supporting 40 percent or more canopy closure may function as NSO dispersal habitat. The remaining acres within the LSR contains grassland, oak woodlands, shrub communities, meadow complexes, wetlands, and non-vegetated areas (rock outcrops and waterbodies).

Plant Communities and Vegetation Descriptions

Vegetation Classification and Condition

The complex nature of local environmental factors and the mixing of floristic elements across the four ecoregions makes classification of vegetation in the Jenny Creek LSR a challenge. Also plant communities are not static; they are in a state of constant change caused by shifting abiotic and biotic conditions over time. Vegetation creates a mosaic of zones/series and associations related to elevation, temperature, aspect, soils, land use, location, and the ecological characteristics of the species.

Various vegetation schemes have been developed for vegetation classification for the plant communities found within the Jenny Creek LSR (see Appendix A). These sources have been used in the description of the vegetation below. Other sources, as well, including plant lists compiled from sensitive plant surveys were used.

Plant Communities Descriptions

Plant communities descriptions are presented below and associated plant communities dynamics are given below and in Appendix A. General plant community acreage found within the Jenny Creek LSR is summarized by ecoregion in Table 2-2. Distribution of plant communities within Jenny Creek LSR and surrounding area is displayed in Map 2-3

Grasslands

Four grassland types based on classifications by Thompson and Drewin 1983 are listed below:

Steep Foothill Grassland

Bluebunch wheatgrass (*Agropyron* [*Pseudorogneria*] *spicata*) dominate the site with variable amounts of Idaho fescue (*Festuca idahoense*) and Lemmon needlegrass (*Stipa* [*Achnatherum*] *lemmonii*). Sites occur on shallow soils on south-facing slopes that exceed 40 percent. Elevation ranges from 1,800 to 4,000 feet.

Steep Mountain Grassland

Idaho fescue (*Festuca idahoense*) dominates the site with variable amounts of bluebunch wheatgrass (*Agropyron* [*Pseudorogneria*] *spicata*) and Lemmon needlegrass (*Stipa* [*Achnatherum*] *lemmonii*).

Sites are located on steep (over 40 percent) south-facing slopes with shallow, rocky soils. Elevation varies from 3,000 to 5,500 feet.

High Mountain Grassland

Variable amounts of Idaho fescue (*Festuca idahoense*) and Lemmon needlegrass (*Stipa* [*Achnatherum*] *lemmonii*) dominate the sites, with minor amounts of bluebunch wheatgrass (*Agropyron* [*Pseudorogneria*] *spicata*). High snow fall areas. High elevation (above 5,000 feet) with shallow rocky soils similar to Steep Mountain and Steep Foothill Grassland sites.

Dry Meadow Grassland

Flatter sites on moderately deep soils with a high shrink swell capacity. Ground vegetation consists of California oatgrass (*Danthonia californica*), pine bluegrass (*Poa secunda* [*P. scabrella*]), and various forbs. Meadow sites with scant canopy cover. Elevation varies from 1,600 to 6,000 feet.

Oak Woodlands

The trees are predominantly Oregon white oak (*Quercus garryana*) with some California black oak (*Q. kelloggii*), Pacific madrone (*Arbutus menziesii*), and large scattered ponderosa pines (*Pinus ponderosa*), both living and dead snags, that tower above the surrounding vegetation. The understory shrubs include: deerbrush (*Ceanothus intergerrimus*), poison oak (*Rhus diversiloba*), Oregon grape (*Berberis aquifolium*), whiteleaf manzanita (*Arctostaphylos viscida*), and some bitterbrush (*Purshia tridentata*). The ground layer consists of various forbs and grasses that include: spreading dogbane (*Apocynum androsaemifolium*), hairy honeysuckle (*Lonicera hispidula*), Puget balsamroot (*Balsamorhiza deltoidea*), California fescue (*Festuca californica*), whiteleaf lupine (*Lupinus albifrons*), and several paintbrushes (*Castilleja* sp.). Yellow starthistle (*Centaurea solstitialis*) and various annual grasses, Medusa-head rye (*Taeniatherum* [*Elymus*] *caput-medusae*), and bulbous bluegrass (*Poa bulbosa*) are well established naturalized weeds.

Oak woodlands vary from open savannas with a grass dominated understory to forest stands with intermingled Douglas-fir (*Pseudotsuga menziesii*) and ponderosa pine (*Pinus ponderosa*). On higher slopes, Oregon white oak may form solid stands of short (<6 m) trees with closed canopies intermixed with native plums and mountain mahogany. Oregon white oaks at higher elevations approach the diminished size and stature of Brewer oak (*Quercus garryana* var. *breweri*). On the flats, oak forest structure may consist of widely separated, large, old savanna-form oaks (greater than 250 years old) surrounded by numerous younger (less than 125 year old) crowded, forest-form oaks. Savanna-form oaks are recognized by their stout trunks, broad, spreading branches, and rounded crowns. Forest-form oaks have slender trunks, ascending branches and are much closer together. Presumably, the savanna-form oaks formed under a regime of frequent light fires. The crowded forest-form oaks developed with the cessation of fire in the last 100 years that allowed seedlings to grow to maturity.

Brush fields are occasionally interspersed in the oak woodlands. At lower elevations, patches dominated by whiteleaf manzanita (*Arctostaphylos viscida*), wedgeleaf ceanothus (*Ceanothus*

cuneatus), and poison oak (*Rhus diversiloba*) are common. At higher elevations, deerbrush (*C. intergerrimus*), mountain whitethorn ceanothus (*C. cordulatus*), sunkbrush sumac (*Rhus trilobata*), and brown dogwood dominate the brush fields. Chokecherry (*Prunus virginiana*), bittercherry (*P. emarginata*), Klamath plum (*P. subcordata*), birchleaf mountain mahogany (*Cercocarpus montanus*), pale serviceberry (*Amelanchier pallida*), and yellow rabbitbrush (*Chrysothamnus viscidiflorus*) also make up a significant portion of the brushfield flora. This complex collection of shrubs is commonly known as Southern Oregon Chaparral. Communities dominated by members of the rose family (plums and chokecherry (*Prunus* spp.), birchleaf mountain mahogany (*Cercocarpus montanus*), and serviceberry (*Amelanchier alnifolia*) are commonly referred to as rosaceous chaparral.

Mahogany-Oak-Fescue

A typically dry site with high densities of Oregon white oak and Birchleaf mountain-mahogany. Understory predominately consists of Idaho fescue (*Festuca idahoense*) and a variety of forbs. Soils are moderately deep with clayey subsurface horizons. Most sites occur on moderately steep to steep slopes.

Oak-Pine-Fescue

This site type occurs most typically on gently rolling hills at low elevations and on steep south-facing slopes at the higher elevations. Overstory is dominated by Oregon white oak and secondary amounts of ponderosa pine. Understory is mainly Idaho fescue (*Festuca idahoense*) with minor densities of bluebunch wheatgrass (*Agropyron* [*Pseudorogneria*] *spicata*). Forbs are variable. Soils are well-drained, shallow, and rocky.

Oak-Pine-Oatgrass

Canopy cover of Oregon white oak, usually at high densities, with minor amounts of ponderosa pine. Dominant grass is California oatgrass. Soils are clayey at subsurface horizons. These sites are typically found on gentle slopes or flats at both north and south aspects.

Western Juniper-Oregon White Oak Woodland

Kagan and Caicco (1996) describe a western juniper-Oregon white oak woodland on south slopes and rolling hills found around Siskiyou Pass and Pilot Rock east along the California border often on deep clay, stony soils. A similar type is found in the Oregon Gulch RNA. Western juniper and Oregon white oak co-dominant with ponderosa pine along the margins or as isolated individuals within the stand. Wedgeleaf ceanothus is the dominant shrub, although Klamath plum (*Prunus subcordata*), Brewer oak (*Quercus garryana* var. *breweri*), and serviceberry (*Amelanchier alnifolia*) are important under the oak canopy. Idaho fescue (*Festuca idahoense*), bluestem wheatgrass (*Agropyron* [*Pseudorogneria*] *spicata*), California oatgrass (*Danthonia californica*), pine bluegrass (*Poa sucunda*), and needlegrasses (*Stipa* [*Achnatherum*] spp.) are dominant native grasses. However, the habitat is usually dominated by introduced alien annual grasses, including Medusahead rye (*Taeniatherium caput-medusae*), dogtail (*Cynosurus echinatus*), and various *Bromus* species. Forbs include: wooly sunflower (*Eriophyllum lanatum*), Western hawkbeard (*Crepis occidentalis*), narrowleaf desert parsley (*Lomatium triternatum*), Oregon mariposa lily (*Calochortus tolmei*), Blepharipappus (*Blepharipappus scaber*), and woolyhead clover (*Trifolium eriocephalum*). At lower

elevations, yellow starthistle (*Centaurea solstitialis*) can be a significant weed. Thompson and Drewien (1983) described several range sites dominated by oaks

Ponderosa Pine-Oak-Fescue

Overstory is dominated by ponderosa pine, Oregon white oak, and/or California black oak. Ground cover consists of high densities of Idaho fescue (*Festuca idahoense*). Mid-story may include birchleaf mountain-mahogany, serviceberry, and/or Klamath plum. Soils are moderately deep and are well-drained. Most sites occur on rolling hills, though some are found on steep slopes.

Mixed Conifer Zone/White Fir Series

At higher elevations, the Interior Valley Zone fades into the Mixed Conifer Zone. The demarcation between zones may be distinct or obscure. Douglas-fir, ponderosa pine, and other conifers become evident often with an increase in golden chinquapin (*Chrysolepis chrysophylla*), Oregon grape (*Berberis aquifolium*), baldhip rose (*Rosa gymnocarpa*), and additional ceanothus species. There is no clear transition at higher elevations between the Mixed Conifer Zone and the White Fir Zone. The Mixed Conifer Zone is found in the Upper Tyler Creek, Baldy, Middle Jenny, Keene Creek, and Lower Jenny subwatersheds between 2,500 and 4,200 feet elevation. The Mixed Conifer Zone landscape pattern is coarse grained because of interspersed shrublands, meadows, clearcuts, and forest land.

The Mixed Conifer Zone supports a variety of conifers including Douglas-fir (*Pseudotsuga menziesii*), white fir (*Abies concolor*), ponderosa pine (*Pinus ponderosa*), sugar pine (*P. lambertiana*), incense cedar (*Calocedrus decurrens*), Pacific yew (*Taxus brevifolia*), and western juniper (*Juniperus occidentalis*). Douglas-fir is the most common conifer with sugar pine, ponderosa pine, and incense cedar also present in the overstory of mature stands. In mature stands, white fir (and Douglas-fir with enough canopy gaps) dominates other understory conifers, which indicates that it is the climax species. Before 1910, more frequent fires prevented the more flammable, shade tolerant white fir from becoming a dominant climax species at lower elevations. As a result of fire cessation, a shift toward dense stands of white and Douglas-fir at the expense of sugar pine, ponderosa pine, and incense cedar has occurred.

Much of the Mixed Conifer Zone and all of the white fir zone in the Jenny Creek LSR would be classified with Atzet et al. (1996) the white fir series made up of several white fir (ABCO) associations. White fir associations are recognized by a high rate of constancy (the percent of plots with a given species present) among understory trees. In some plant communities, Douglas-fir might have 100 percent constancy in the overstory but would be considered a white fir association because 100 percent constancy of white firs in the understory.

The Atzet et al. (1996) White-fir-Incense Cedar/Western Starflower (ABCO 44) plant association is particularly well represented in the LSR. Douglas-fir, white fir, incense-cedar, and sugar pine are the main overstory trees. White fir is the main constituent among the understory trees and has increased to the detriment of the less shade tolerant sugar pine, Douglas-fir, and incense cedar with lack of fire

as an important ecosystem factor. Sugar pine and incense cedar quickly fill in canopy gaps caused by blow-down white fir and Douglas-fir that have succumbed to *Phellinus weirii* and other root rot infections. Sugar pine in many associations often appears as the long-term dominant continuing to grow as generations of white fir and Douglas-fir perish from fire or root rot. Sugar pine usually occurs as isolated individuals and never in solid stands. White fir stocking levels have increased compared to other conifers in the area because of fire suppression and lack of Native American fire

Table 2-2. Acreages of general plant communities within LSR by ecoregion

General Plant Community (acres)	Southern Cascade Slopes (9i)	Southern Cascades (4a)	Siskiyou Foothills (78b)	Klamath River Ridges (78a)	Total area in LSR	Percentage of LSR
Grass/shrub/oak woodland mosaic	3,081	141	1,354	3,740	8,316	
Percent	55.1%	1.4%	23.4%	30.1%		24.6%
Juniper domination	84	576	486	480	1,626	
Percent	1.5%	5.6%	8.4%	3.9%		4.8%
Pine domination	132	175	661	1,269	2,237	
Percent	2.4%	1.7%	11.4%	10.2%		6.6%
Mixed conifer*	2,285	7,662	3,002	6,339	19,288	
Percent	40.9%	75.0%	51.9%	51.1%		56.7%
White fir*	0	1,597	276	580	2,453	
Percent	0.0%	15.6%	4.8%	4.7%		7.2%
Semi-wet/wet meadow	9	69	0	9	87	
Percent	0.2%	0.7%	0.0%	0.1%		0.3%
Total (acres)	5,591	10,220	5,779	12,417	34,007	
Percent	100.0%	100.0%	100.0%	100.0%		100.2%

* Mixed conifer and White fir Plant Communities contribute the most acreage toward current and potential LSOG/NSO habitat.

land management practice. Under even the lightest fire regimes, young white firs are fire sensitive because of low branches that sweep to the ground creating fuel ladders to the crowns and relatively thin resinous bark.

Kagan and Caicco (1996) recognize a Siskiyou-Sierra mixed conifer forest on the western slopes of the southern Cascades and in the eastern Siskiyou Mountains. They describe this forest as an open to closed canopy forest with numerous co-dominant conifers made up of a rich assemblage of trees, shrubs, and forbs. The forest type varies in elevation from 2,500 to 5,500 feet. In the Jenny Creek LSR, many of the Siskiyou species mentioned drop out (Port Orford-cedar and Tanbark-oak). Diagnostic trees in the LSR include: white fir, incense-cedar (*Calocedrus decurrens*), sugar pine (*Pinus lambertiana*), ponderosa pine, and Douglas-fir. Shrubs include: vine maple (*Acer circinatum*), pinemat manzanita (*Arctostaphylos nevadensis*), little Oregon-grape (*Berberis nervosa*), oceanspray (*Holodiscus discolor*), baldhip rose (*Rosa gymnocarpa*), creeping snowberry (*Symphoricarpos mollis*), and western yew (*Taxus brevifolia*). Forbs include: vanilla-leaf (*Achyls*

triphylla), threeleaf anemone (*Anemone deltoidea*), spreading dogbane (*Apocynum androsaemifolium*), bigleaf sandwort (*Moehringia* [*Arenaria*] *macrophylla*), prince's-pine (*Chimaphila umbellata*), Hooker fairybells (*Disporum hookeri*), rattlesnake-plantain (*Goodyear oblongifolia*), whiteflower hawkweed (*Hieracium albiflorum*), slendertube iris (*Iris chrysophylla*), twinflower (*Linnaea borealis*), oneside wintergreen (*Pyrola secunda*), starflower solomonseal (*Smilacina stellata*), western starflower (*Trientalis latifolia*), evergreen violet (*Viola sempervirens*), Whipplevine (*Whipplea modesta*), and bear-grass (*Xerophyllum tenax*). Other species are trees, such as the bigleaf maple (*Acer macrophyllum*), madrone (*Arbutus menziesii*), and chinquapin (*Chrysolepis chrysophylla*); shrubs include: greenleaf manzanita (*Arctostaphylos patula*), the Oregon-grapes (*Berberis aquifolium*, *B. nervosa*), pinemat manzanita (*Arctostaphylos prostratus*), hairy honeysuckle (*Lonicera hispidula*), and poison-oak (*Rhus diversiloba*).

Elements of Kagan and Caicco's (1996) Douglas-fir - ponderosa pine - incense-cedar forest are present. This lower to middle-montane forest has a closed to open canopy. Douglas-fir is commonly the dominant tree although other conifers may be present. It is found along the western slopes of the southern Oregon Cascades between 2,000-3,500 feet elevation.

Most of the young stands have become established and are developing under markedly different disturbance regimes than the older stands that currently represent LSOG habitats. Because of altered natural disturbance regimes, including fire suppression, the proliferation of pathogens, accelerated fragmentation, climate change, and shifts in species composition, many of these stands are on developmental trajectories that may not provide adequate or desirable structural LSOG characteristics.

Mixed Conifer Forest

Conifer forest plant associations were distinguished by Thompson and Drewien (1983) distinguished as following:

Douglas-fir Forest

Overstory is dominated by Douglas-fir with California black oak and madrone. Ponderosa pine is present in minor amounts. Grasses consist mainly of western fescue (*Festuca occidentalis*), mountain brome (*Bromus*), and California fescue (*Festuca californica*). Site type is typically found on deep to moderately deep soils on north slopes (sometimes south slopes).

Douglas-fir/Mixed Pine

Douglas-fir dominates the overstory with sugar pine and ponderosa pine present. Western fescue (*Festuca occidentalis*), Alaska onion-grass (*Melica subulata*), and California brome (*Bromus carinatus*) are chief understory species. Soils are moderately deep and high in iron, sometimes stony and gravelly throughout the profile. Sites occur on nearly flat to steep slopes, usually south-facing slopes.

Mixed Fir-Oceanspray

White fir is the dominant species, although Douglas-fir is found at high densities in this site type. Pines are scarce. Oceanspray is the dominant mid-story species. Mountain brome (*Bromus marginatus*), western fescue (*Festuca occidentalis*), and Alaska onion-grass (*Melica subulata*) are predominant understory grasses. Most sites are on moderately steep, north slopes. Soils are deep with a loam surface horizon and clay loam subsurface.

Mixed Fir Forest

Similar to the Mixed Fir-Oceanspray site, dominance of understory by oceanspray is not evident. Understory is shared Rocky Mountain maple (*Acer glabrum*), deerbrush, serviceberry, and hazelnut (*Corylus cornuta* var. *californica*). Sites have deep clay loam soils on steep north-facing slopes.

Fire plays an important role in the development and maintenance of the range of mixed conifer plant communities. Many present-day mixed conifer sites show overcrowding by a dense Douglas-fir and/or white fir understory. This follows fire suppression or overstory tree canopy reduction. The reintroduction of fire in conifer communities with a dense understory results in catastrophic fire, introducing an undesired fire cycle leading to dog-hair stands or dense brush. States including dense Douglas-fir and/or white fir understories are more susceptible to beetle and fungal pathogen infestation. In many cases, this can result in the loss of the remaining late seral component. See Figure 2-1.

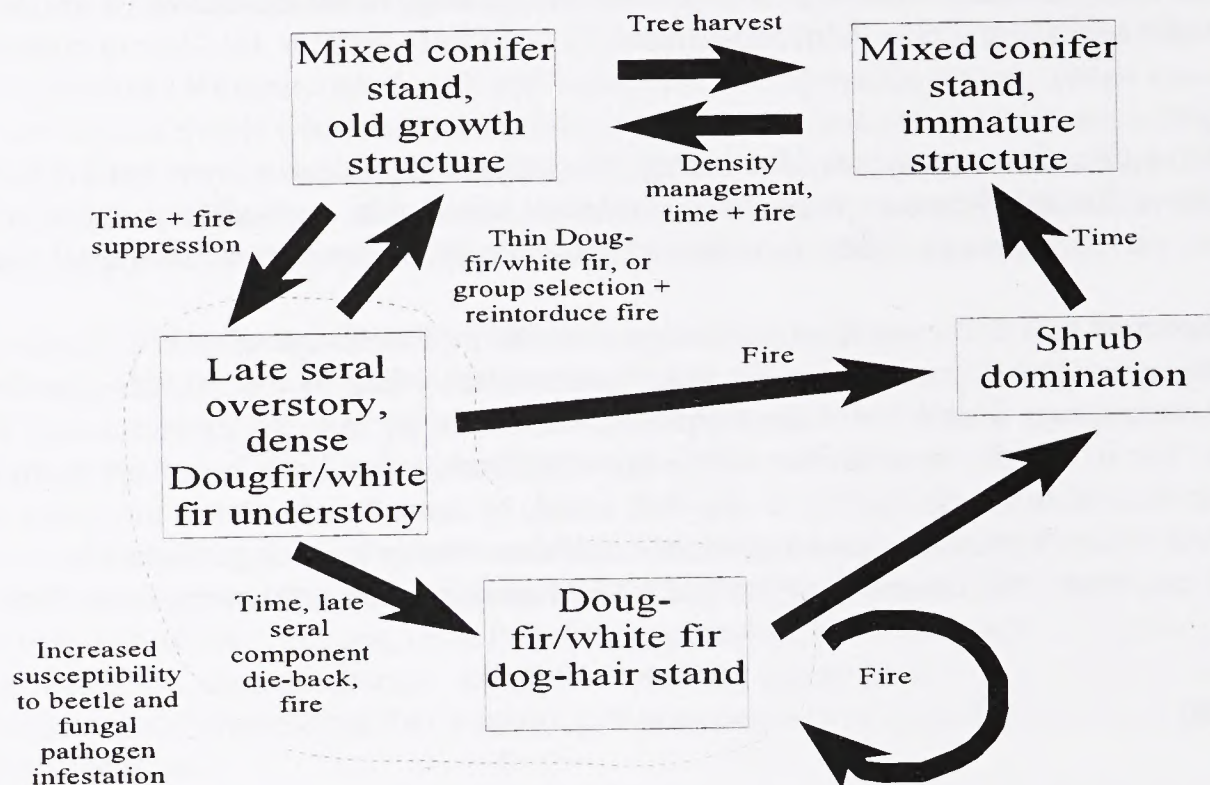
White Fir Forest

White fir (*Abies concolor*) is the dominant species. Other conifers are scarce. Alaska onion-grass (*Melica subulata*), Ross sedge (*Carex rossii*), and mountain brome (*Bromus marginatus*) are significant grasses in the understory. Sites may be on flats or steep slopes. Soils are usually deep clay loams, although some sites are stony throughout the profile.

Franklin and Dryness (1973) describe the White Fir Zone as a narrow belt located at the upper margin of the Mixed Conifer Zone. In southwestern Oregon, this zone is not as clearly separated from adjacent vegetative zones as it is in other regions in the state. In the Jenny Creek LSR, there is a gradual transition from the Mixed Conifer Zone to the White Fir Zone beginning at the 4,200 foot elevation. The White Fir Zone becomes clearly recognizable above 5,000 feet around Hyatt Lake and on Table, Chinquapin, Soda, Porcupine and Hobart mountains. It occupies most of the higher elevation areas. The White Fir Zone differs from the Mixed Conifer Zone by having significant winter snow accumulations. Consequently, vegetation suffers less stress from lack of moisture. This zone is found within the Upper Jenny Creek, Middle Jenny, and Keene Creek subwatersheds. The landscape pattern of this zone is more fine grained than the previous vegetation zones; numerous clearcuts, meadows, and rock outcrops are present in the landscape.

The White Fir Zone is characterized by extensive stands of coniferous forest interspersed with wet meadows. White fir is the major tree species and may occur as pure or nearly pure stands. In areas where there is a mixture with other conifers, Douglas-fir is the most common associate. Sugar pine,

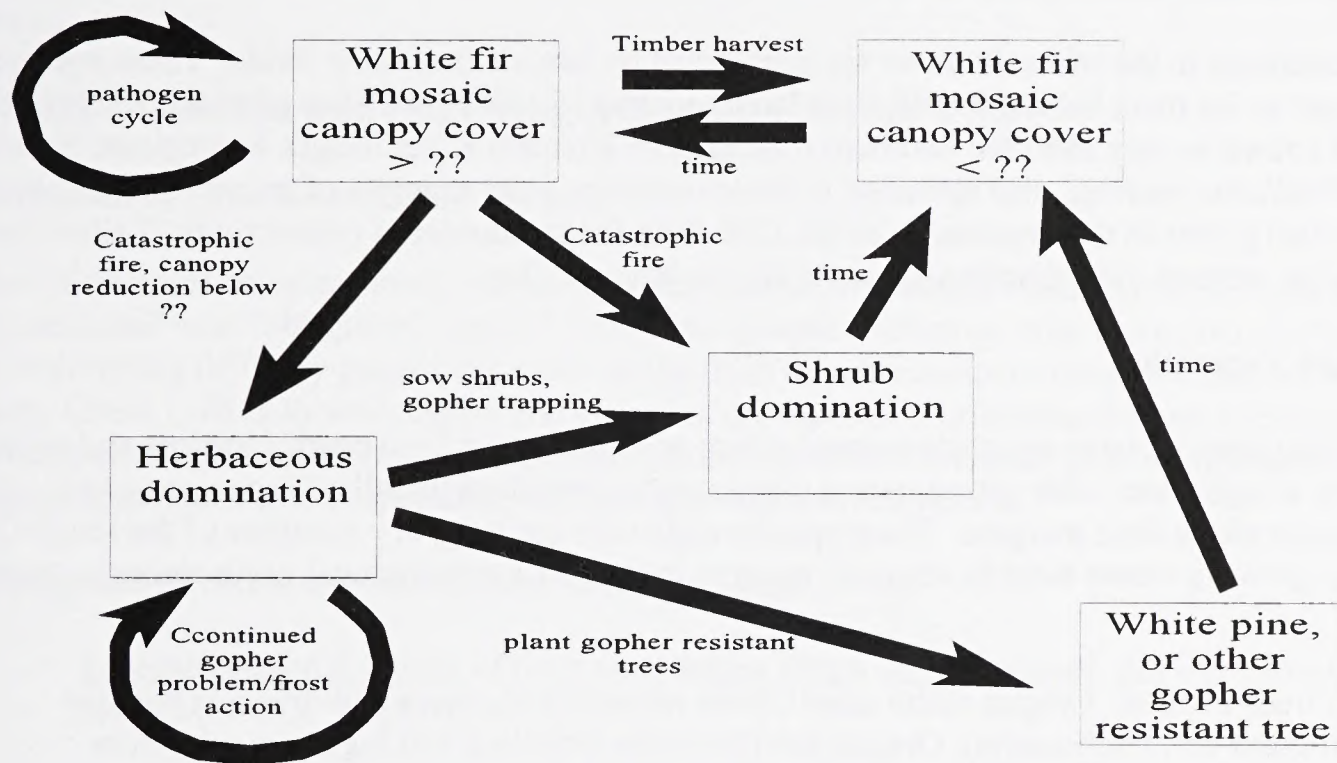
Figure 2-1. Mixed Conifer Plant Community Dynamics



ponderosa pine, and incense cedar may also be present. Ponderosa pine, Jeffrey and lodgepole pine have been used extensively in plantations as they are more tolerant of the severe frost conditions than some other species such as Douglas-fir. Lodgepole pine is also found as a pioneer species occurring naturally, particularly on the edges of frost prone meadows. It was likely more common during the little ice age of the 19th century.

Where white fir predominates at higher elevations and on northerly aspects, ecosystem function and the process creates a temporal/spatial mosaic of white fir and incense cedar (Figure 2-2). White fir are subject to several fungal pathogens that create openings in the previously white fir dominated canopy when trees die. Less susceptible species such as incense cedar and Douglas-fir then become locally established. Re-invasion by the more shade-tolerant white fir coupled with the eventual mortality of the incense cedar and Douglas fir-result in a reversion to white fir domination. This pathogen mediated cycling in plant community composition can be broken by excessive tree harvest. Older clearcuts and partial harvests may become shrub-invaded as with Douglas-fir and mixed fir communities, or suffer frost action and gopher predation. In the latter case, the restocking of some tree species in the short term becomes near impossible--trees being girdled by gophers. Insect outbreaks can also play an important role in plant community dynamics. When fire does occur, it is usually considered to be a stand replacement event.

Figure 2-2. White Fir Community Dynamics



Shasta Fir Forest

This site type is absent from the Jenny Creek LSR.

Semi-Wet Meadows

Sites are located on flats under semi-wet conditions. Moderately deep, clay-loam soils are poorly drained. Graminoids dominated by California oatgrass (*Danthonia californica*) and meadow sedge (*Carex praticola*). Swamp buttercup (*Ranunculus orthorhynchus*) is usually the dominant forb. Elevation varies.

There are numerous open, wet areas in the LSR that support a variety of characteristic forbs depending on soils, hydrology, and seasonality and duration of soil moisture in addition to the semi-wet meadows described Thompson and Drewien (1983). Some open areas with a continuous water supply for much of the growing season support extensive open areas dominated by California false-hellebore (*Veratrum californicum*), with nettle-leaf giant hyssop (*Agastache urticifolia*), parsley-leaf licorice-root, alpine timothy (*Phleum alpinum*), Columbia brome (*Bromus vulgaris*), showy onion-grass (*Melica spectabilis*), lupines, paintbrushes, and owl-clover.

Meadows in the White Fir Zone frequently have islands of white fir in them. The white fir in these islands form compact, densely stocked units where crowns extend to the tree base on the outer meadow edge. The interiors of these tree groups are protected from wind exposure and moisture extremes. A moist, shady microclimate is maintained that is beneficial to tree and stand vigor and that is preferred habitat for many wildlife species.

Some openings in the white fir forest are maintained by late melting snow fields. These openings are important as the main habitat for Klamath lambs-tongue (*Erythronium klamathense*), an endemic species known mostly from the Southern Cascade and Klamath River Ridges Ecoregions. Yellow-bells (*Fritillaria pudica*), also abundant in these openings, is an example of an east of the Cascade species that points to the importance of the LSR from the standpoint of connectivity. Yellow-bells reaches its western most distribution in the Rogue River Valley.

Riparian Vegetation

As defined here, riparian vegetation grows where adequate water from nearby streams and small ponds or a high water table can support a characteristic terrestrial broadleaf deciduous plant community along their margins. These species cope with the long, dry summers of the Jenny Creek LSR by growing where there is adequate water to meet their transpirational needs throughout the dry period.

Typical trees include: Oregon white alder (*Alnus rhombifolia*), black cottonwood (*Populus balsamifera* var. *trichocarpa*), Oregon ash (*Fraxinus latifolia*), and bigleaf maple (*Acer macrophyllum*).

Commonly encountered shrubs are mock-orange (*Philadelphus lewisii*), willow species (*Salix* spp.), Douglas spiraea (*Spiraea douglasii*), ninebark (*Physocarpus capitatus*), Indian-plum (*Oemleria cerasiformis*), and Douglas hawthorn (*Crataegus douglasii*).

Aquatic Vegetation

Aquatic vegetation consists of those species that grow in or near still or flowing water and may be free-floating or attached and/or emergent. Free-floating species include various duckweeds and their relatives (*Lemna*, *Spirodela*, and *Wolffia*). These tiny plants float on the surface of ponds and in still water of flowing streams. Common attached floating vegetation consists of water-star wort (*Callitriche* sp.), waterweed (*Elodea*), various species of pondweed (*Potamogeton*), water smartweed (*Polygonum amphibium*), and Indian pond-lily (*Nuphar polysepalum*). Emergent species include: cattail (*Typha latifolia*), bulrush (*Scirpus* sp.), spike-rush (*Eleocharis* sp.), and bur-reed (*Sparganium* sp.), and water plantain (*Alisma* sp.). These species occur at different places in the Jenny Creek LSR (in streams, stockponds, and the Parsnip Lakes) depending on current water depth and substrate.

The wet lands associated with patterned ground and vernal pools support a diverse and biologically important flora. As vernal pools dry seasonally, they undergo a series of transformations with one set

of species replacing another. These vernal pools are characterized by species. Howell quillwort (*Isoetes howellii*), least mouse-tail (*Myosurus minimus*), mountain navarretia (*Navarretia intertexta*), downingia (*Downingia elegans*), and various species of popcorn-flowers (*Plagiobothrys* spp.). The most significant species is Bellinger meadowfoam (*Limnanthes flocosa* var. *bellingeriana*), a Federal Species of Concern and ONHP Level 1 species is discussed further under Plant Species with Special Status.

LSOG Definition and Factoring Affecting Current LSOG

Definition of Late-Successional Forest

One of the most complex questions facing natural resource managers today is the definition of "late-successional" and "old-growth forest." This basic question becomes even more difficult because old-growth forests differ by geographic area. In the relatively dry southern Oregon Cascades where Jenny Creek LSR is located, aspect and elevation are especially influential factors effecting forest development and thus habitat development. These two factors bring about their influence by changing moisture and temperature, and thus growing site conditions.

Throughout this LSR assessment these terms are found:

Late-successional forests - Forest seral stages which include mature and old-growth age classes [LSOG] (FEMAT).

Mature forest (mature seral stage) - The period in the life of a forest stand from culmination of mean annual increment [generally at 80-100 years of age] to an old-growth stage or to 200+ years. This is a time of gradually increasing diversity (FEMAT).

Old-growth forest - A forest stand usually at least 180-220 year old with moderate to high canopy closure, a multilayered, multispecies canopy dominated by large overstory trees; high incidence of large trees, some with broken tops and other indications of old and decaying wood (decadence); numerous large snags; and heavy accumulations of wood, including large logs on the ground (FEMAT).

The terms are **not** interchangeable. "Mature" and "Old-growth" are two different stand development stages (NFP/ROD). "Late-successional" habitat is defined as those stands that are either in an old-growth condition or a mature condition. That is:

Old-growth stands + Mature stands = Late-successional (LSOG) stands

Old-growth forests are later stages in forest development that are distinct from earlier successional stages (Franklin and Spies 1991), usually in composition and always in structure. Structurally, old-growth stands have a larger range of tree sizes and spacing. The age at which forests become old-growth varies widely with forest type, site conditions, and stand history. Multiple canopy layers are

generally present and total organic matter accumulations are high. Functionally, old-growth forests have dominant trees that grow slowly and have stable biomass accumulations that are constant over long periods of time. Old-growth Douglas-fir forests are approximately 200 to over 1,000 years old depending upon the criteria described above. Jenny Creek LSR contains several different vegetation associations and old-growth habitat is different in each of the vegetation associations in the LSR; however, there are some common habitat attributes.

Old-growth forests are important because of their functional and compositional uniqueness. The following is a list of major ecological features generally common to old-growth forests (Franklin et al. 1981):

1. Several vertebrate species (red tree vole, NSO, and northern flying squirrel), saprophytic plants and epiphytic, and nitrogen fixing lichens find optimum habitat in old-growth forests. There are substantial differences in composition and relative abundance of species between young and old-growth forests.
2. Old-growth forests are highly retentive of nutrients. Losses of limiting nutrients, such as nitrogen, are low. Bacterial nitrogen fixation appears to be common in large woody debris.
3. Large snags are valuable as habitat for a variety of vertebrates and as a future source of downed logs.
4. Logs on the forest floor are important habitats for small mammals, including species that disperse spores of mycorrhizal fungi.
5. Logs are critical to maintenance of physical and biological stability in headwater streams. Debris dams create stepped stream profiles that dissipate energy otherwise used for sediment transport and lateral cutting and downcutting of stream channels. The debris dams and their associated plunge pools and beds of trapped gravels and fine sediments, provide a range of habitats needed to maintain a full array of stream and stream-margin organisms. Small to medium-sized streams in old-growth forests depend mainly on forest litter for an energy base. The bulk of the nitrogen supply to streams comes from woody debris.

Old-growth forest is a biological or ecological concept that presumes ecosystems change over time. An old-growth forest ecosystem is a forest community and its habitat where the constituent organisms and their environments interact in a vast and complex energy cycle (Spurr 1964). Old-growth and old-growth forest ecosystems are therefore defined by structure and function.

Factors Affecting Condition of LSOG Habitat

Many factors affect a piece of land's ability to grow and support LSOG habitat. Some are human factors, some natural, and others are a mix of both; some of these factors are discussed below. Where a factor falls into both the human and natural category, it has been placed under the category with the prevalent influence.

Previous Timber Harvest Entries

Most of the forest lands within the LSR have been logged to some extent. Many stands have been entered several times with various types of harvest. The remaining vegetation left behind either as some type of residual stand or a newly established stand will determine what habitats the area has the potential to produce. Past harvest has been in the form of clearcuts, mortality salvage, or high-grade logging. (Two sections were from a land exchange following high-grade logging). Timber harvest methods have resulted in differing species mixes and tree sizes on the site; however, all methods have reduced the number of large trees and snags, which are principal components of LSOG habitat. Only some uses by particular species are reduced depending on the level of harvest. The biggest influence of past harvest is that it limits some future stand development options while preserving others.

Some light mortality salvage and high grade entries left residual stands that have now grown into functional NSO nesting habitat. However, the majority of the high quality NSO nest stands have not had previous timber harvest entry.

Fire Effects and Its Absence

Some forest stands burn up, others underburn. What remains and what returns as regeneration dictates the possibilities for the stand. Even stand-replacing fires do not kill all trees in a stand. Live trees are often left in clumps and as individual trees. These trees continue to grow in an open canopy environment, while the post-fire stand grows up around them. Remnant trees develop LSOG characteristics, including large size, hollows, fire scars, and large limbs. These trees are often of a different species than the dominant species in the "new" stand, and add species diversity as well as structure. Remnant trees are essential components of LSOG habitat that provide nests, roosts, dens, and hibernation sites for a wide variety of LSOG associated wildlife species. Younger trees in the stand generally do not have these microhabitat features.

The current structure and species composition of all forest stands in the LSR reflect modern human influence. Human intervention in the stand development process has mostly been through timber harvest and fire suppression. It does not appear that species have been lost from most stands. Old clearcuts planted to only one or two species will not develop into diverse stands without future intervention aimed at increasing species diversity. Many mature and old-growth stands exhibit the development of almost pure white fir understories. As the dominant pine and Douglas-fir in these stands die out due to old age and competition from the developing understory, usually they will not be replaced by trees of the same species. White-fir invasion is a concern because live white fir trees and snags are less desirable as components of LSOG habitat than are pine and Douglas-fir trees and snags. White fir trees and snags are not as long-lived as Douglas-fir/pine trees and snags. Pure white

fir stands tend to develop extremely high canopy closure, which inhibits the development of herbaceous and shrubby layers, limiting the wildlife diversity in the stand. Large hardwoods are important components of LSOG stands where they occur. Large hardwoods at low elevations in the Siskiyou Foothills Ecoregion tend to provide many of the micro-habitat sites, such as cavities, that remnant giant pine and Douglas-fir do at higher elevations. Hardwoods produce a variety of foods in addition to the forage provided by the conifers present in the stands.

Animals

Animals have a seemingly minor role in changing the landscape pattern and structural diversity of the forest. However, certain species may tend to slow down plant succession and favor early seral stages (porcupine, pocket gophers, beaver, deer, and elk). Wildlife species do contribute to creating small forest openings and even the thinning of dense patches of vegetation or trees. Black bears (*Ursus Americanus*) sometimes kill small patches of pole or small sawtimber by stripping the bark and eating the cambium layer. This usually favors brush species growing in the area, thus creating diversity in the forest canopy layer.

In general, wildlife species richness is dependent on plant community richness and diversity of condition, and distribution across the landscape.

Current Condition of Forest Vegetation

Current forest vegetation was evaluated by two common data bases: (1) Forest Operations Inventory (FOI) and (2) NSO habitat types. They both describe forest conditions but for quite different purposes: (1) FOI stratifies by tree age and size classes to meet current and future timber production demands and (2) NSO habitat types describes forest structural characteristics associated with NSO habitat conditions.

Forest Operation Inventory (FOI) Data

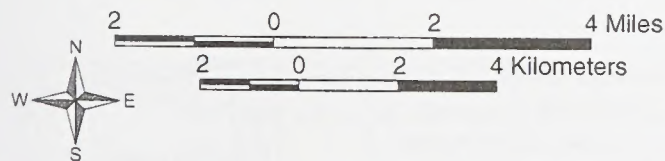
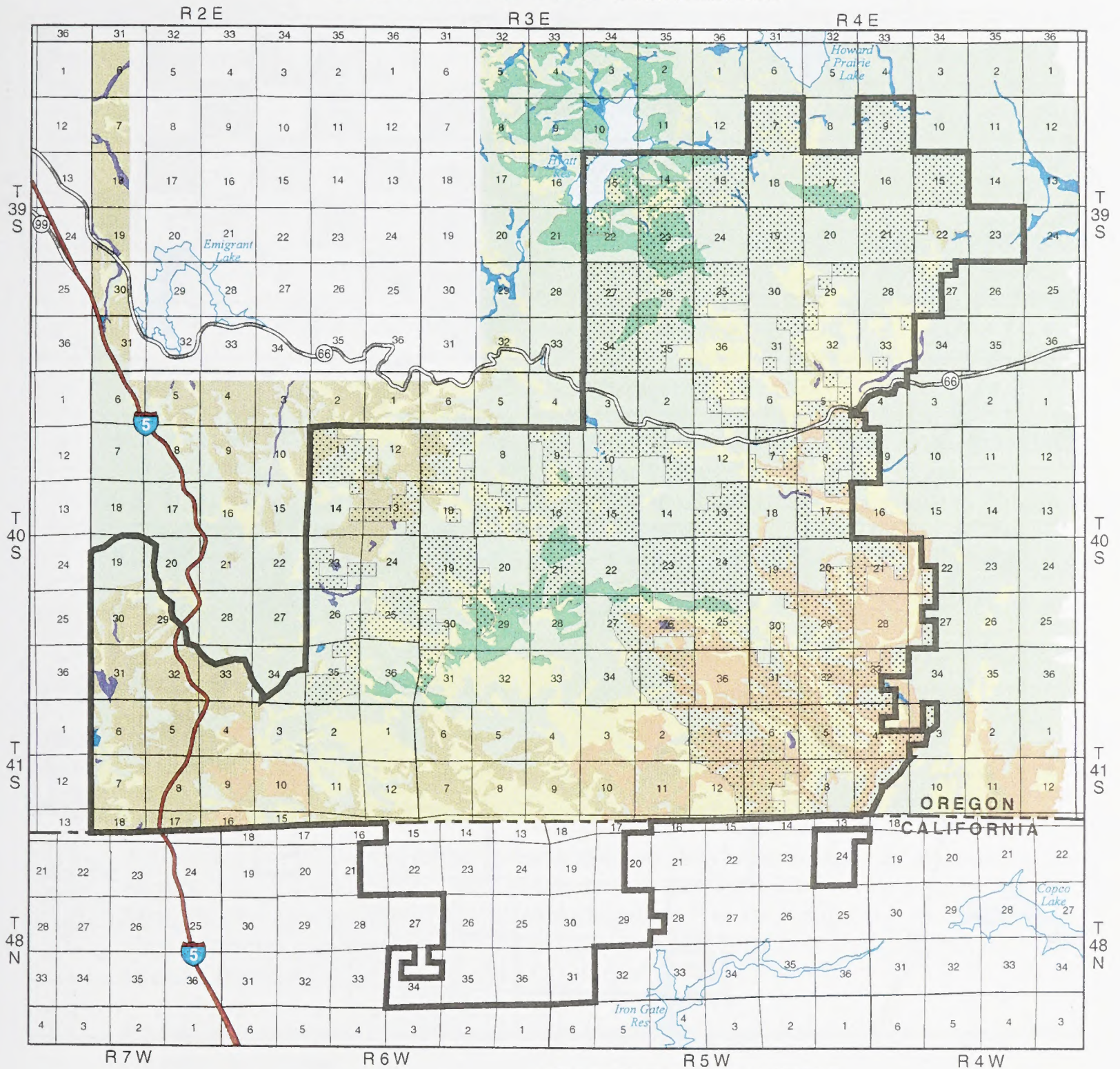
Inventory Definitions

The FOI Forest Inventory Field Instructions for Western Oregon BLM (1987), an inventory for timber production, classified forested land in the following definitions:

Forest land: "land which is, or is capable of being, at least 10 percent stocked by forest trees."

Stand age: *for even-aged stands*, the stand age "is the **average age** of the portion of the stand **that is to be managed**" *for uneven age stand* of mixed species with periodic removal of risk trees, the age of the oldest age group, or the average age classes of the **oldest 10% of the stand** was used.

Jenny Creek Late Successional Reserve Distribution of Plant Communities



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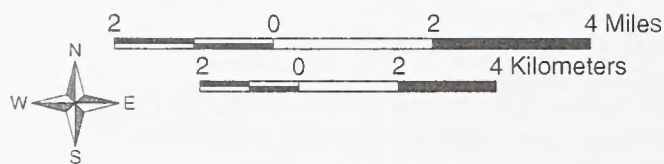
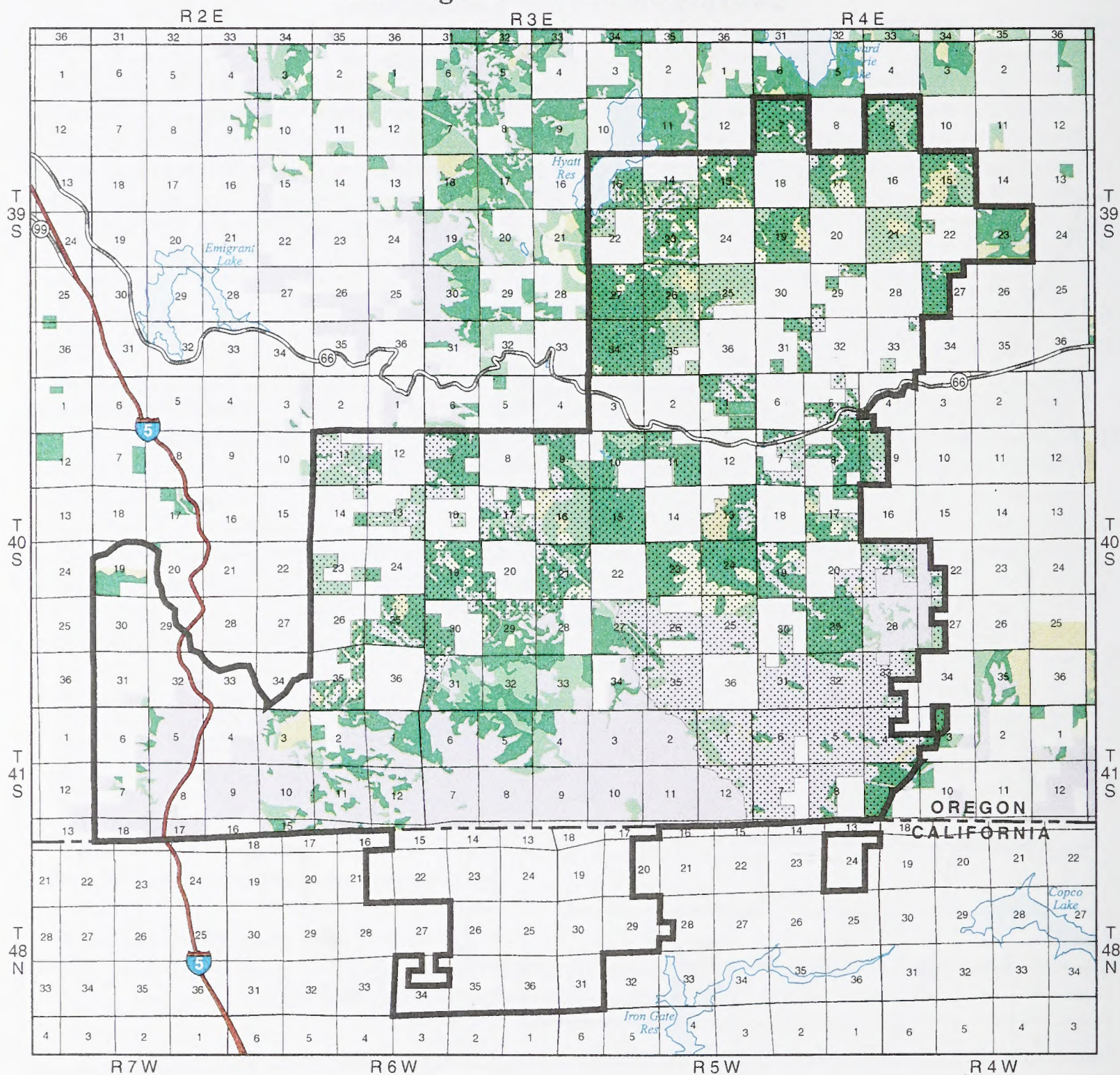
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 - Grassland/Meadow
 - Shrub/Woodland
 - Hardwoodland
 - Mixed Conifer
 - White Fir
 - Semi-Wetland
 - Wetland
 - Open Water
 - No Data Currently Available
- Jenny Creek Late Successional Reserve
- Cascade Siskiyou Ecological Emphasis Analysis Area



MAP 2-3

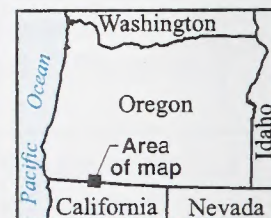
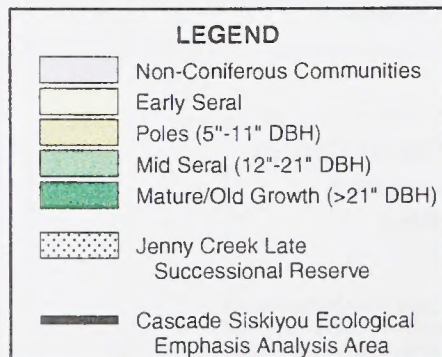
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Jenny Creek Late Successional Reserve Seral Stages of Conifer Communities



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MAP 2-4

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FOI Summary Data

The 1987 Medford FOI acreage for the Jenny Creek LSR (34,007 acres) identified:

- 30,374 acres of forest land (89 percent of LSR acreage)
- 27,522 acres had timber components aged 80 years, or older, age classes (81 percent of the LSR acreage or 91 percent of the forest land).
- 17,037 acres have a timber harvest history (50 percent of the LSR acreage or 56 percent of forest land). Harvest history includes regeneration cutting (3rd stage shelterwood, clearcutting, salvage) or partial cutting (overstory removal, selection harvest, shelterwood 1st and 2nd stage, mortality salvage, or disturbance salvage).
- 1,765 acres were regeneration harvested and now classified as young stands or plantations (5 percent of LSR acreage or 6 percent of the forest land).
- 1,087 acres are young pole stands, 6-11" dbh (4 percent of the forest land)
- 7,073 acres classified with timber components generally 80-150 years old and 11-21 inch dbh (20 percent of LSR acreage or 23 percent of forest land).
- 3,334 acres classified with timber components generally 50-200 years old and 19 inch, or greater, dbh (11 percent of forest land).
- 17,115 acres classified with timber components with age classes generally over 200 years old, or 19-35 inch dbh (50 percent of LSR acreage or 56 percent of forest land).

A summary of FOI data by stand age class and ecoregion is given in Table 2-3. Map 2-4 displays the distribution of seral stages and/or dominant size classes.

Caution When Using FOI Data for Habitat Analysis

FOI stand age or age classes may be a poor indicator of seral stage habitat quality due to some of the following factors:

1. Assessment of stand age in timber inventory process may be inaccurate or inconsistent for seral or habitat classification. Most of the stands within the LSR are uneven aged. While it's likely that the ages as shown in the table are represented in the stand, it may be likely age class represents a minimal amount, as low as 10%, of the total large tree composition. The largest component of the stand could be a younger age class.
2. Past management practices have resulted in a variety of stand characteristics in stands within the same age class.
3. Stand characteristics among stands of similar age class vary as a result of plant communities, current species composition, past disturbance, and the diversity of age classes within the stand.
4. Past natural disturbances resulted in a variety of stand characteristics between stands with same age class.

5. Reliance on stand age alone becomes problematic as stand age approaches 80-100 years. There is less variability of habitat quality between stands in the 0-80 age classes than between stands in the older age classes.

NSO Habitat Type Inventory

In 1992, the Ashland Resource Area completed a 100 percent inventory and classification of all resource area lands as to their current suitability and potential for future suitability for use by NSO. The information sources for this classification were as follows:

- operations Inventory data from the BLM Micro*storms system,
- aerial photographs,
- biologists personal knowledge of the stands, and
- field checks of questionable stands.

Every acre within the Jenny Creek LSR was placed into one of the six possible habitat categories. BLM modified the McKelvie system by dividing two of its habitat types for a total of six habitat types instead of four.

Table 2-3. Ecoregion Forest Operation Inventory (FOI) stand age class data for the forest lands within the Jenny Creek LSR

Ecoregion	Forest Acreage by Stand Age Class (FOI)						All Acreage
	0-30 years	30-80 years	80-150 years	150-200 years	200+ years	Forest Acreage Total	
Klamath River Ridges (78g)	818	224	2,414	644	6,080	10,180	12,418
<i>Percent</i>	8.0%	2.2%	23.7%	6.3%	59.7%	100.0%	82.0%
<i>Age 80 yrs +</i>			23.7%	6.3%	59.7%	89.8%	73.5%
Southern Cascade Slopes (9i)	4	410	225	46	4,364	5,049	5,591
<i>Percent</i>	0.1%	8.1%	4.5%	0.9%	86.4%	100.0%	90.3%
<i>Age 80 yrs +</i>			4.5%	0.9%	86.4%	91.8%	82.9%
Siskiyou Foothills (78b)	233	141	2,410	898	1,560	5,242	5,779
<i>Percent</i>	4.4%	2.7%	46.0%	17.1%	29.8%	100.0%	90.7%
<i>Age 80 yrs +</i>			46.0%	17.1%	29.8%	92.9%	84.2%
Southern Cascades (4g)	710	312	2,024	1,746	5,111	9,903	10,219
<i>Percent</i>	7.2%	3.2%	20.4%	17.6%	51.6%	100.0%	96.9%
<i>Age 80 yrs +</i>			20.4%	17.6%	51.6%	89.7%	86.9%
Totals	1,765	1,087	7,073	3,334	17,115	30,374	34,007
<i>Age 80 yrs +</i>			7,073	3,334	17,115	27,522	
<i>Percent</i>	5.8%	3.6%	23.3%	11.0%	56.3%	100.0%	89.3%
<i>Age 80 yrs +</i>			23.3%	11.0%	56.3%	90.6%	80.9%

Habitat Type Definitions

Definitions of the six NSO habitat types is given in Table 2-4.

Habitat Type Data Summary

A summary of the NSO habitat types Acreage in 34,007 acre Jenny Creek LSR by ecoregion (see Table 2-5) found:

- 21,037 acres (62 percent of LSR acreage, 69 percent of the FOI forest land or 50 percent of NSO NRF capable habitat) has the capacity to provide suitable NSO habitat.
- 10,525 acres (31 percent of the LSR or 35 percent of the forest land) is currently functionally as NSO NRF habitat
- 10,512 acres (31 percent of LSR, 35 percent of FOI forest land, or 50 percent of NSO NRF capable habitat) needs restoration.

Habitat Type Acreage

Acreage of NSO habitat types by ecoregions is given in Table 2-5.

Because the original classification was completed six years ago, there was a need to re-classify some stands due to management actions that occurred subsequent to the original analysis. This was accomplished by biologists examining the stands in question.

Location of the NSO Habitat Types 1-6 areas within the LSR and around the Creek LSR are shown in Maps 2-5 and 2-6.

Table 2-4. NSO habitat type definitions used in the Jenny Creek LSR Assessment

Habitat Type	Definition	Description
Type 1	<u>Nesting</u> : (optimal-meets all NSO life requirements)	Canopy closure greater than 60 percent and canopy structure multi-layered. Overstory trees greater than 21" dbh. Deformed, diseased, and broken top trees present. Large snags and down logs present. This is the best approximate we have for "old-growth" for planning purposes. This category is considered LSOG forest and habitat.
Type 2	<u>Roosting/Foraging</u> : (meets requirements for NSO roosting, foraging and dispersal).	Canopy closure usually greater than 60 percent, with generally single layer structure. Overstory trees greater than 16" dbh. Snags and down wood less prevalent than #1 may be very little. This is the best approximate we have for mature habitat for planning purposes. This category is considered LSOG forest and habitat.
Type 3	<u>Potential Habitat Only/ Young Stands</u> : (meets no known NSO needs currently).	Canopy closure less than 40 percent due to disturbance (logging, fire, etc.), but the area has the potential to become (grow into) habitat 1 or 2 as described above if given enough time and appropriate management. No attempt was made to estimate the time until the stands would reach a Habitat Type 1 or 2 condition. Some residual stands in this category might require only a few decades to reach these suitable habitat conditions while others stands, such as recovering clearcuts and/or stands less than 80 years of age, might take a century or more. Appropriate management of these stands would accelerate development of these stands into suitable habitat. This category has potential to develop into LSOG forest.
Type 4	<u>No Potential</u> : (meets no known NSO needs currently).	Forest canopy closure less than 40 percent. Natural limitations of the site will not allow the area to develop into Habitat Type 1 or 2 as described above. Examples include: chaparral, natural meadows, rocky scablands, and oak woodlands.
Type 5	<u>Dispersal with potential</u> : (currently provides structure believed to be important for NSO dispersal).	Forest canopy closure greater than 40 percent. Disturbance (fire, logging, wind, etc.) has created this condition, but the area has the potential to become (grow into) Habitat Type 1 or 2 as described above if given sufficient time and appropriate management. This category may be considered LSOG forest (80+ years) but have not developed, or have lost through disturbances, an adequate array of attributes to function as NSO (NRF) habitat.
Type 6	<u>Dispersal with no potential</u> : (currently provides structure believed to be important for NSO dispersal.)	Canopy closure greater than 40 percent. Natural conditions limit the canopy closure and forest development potential to the point that the stand will most likely never reach habitat conditions consistent with NSO Habitat Type 1 or 2 as described above.

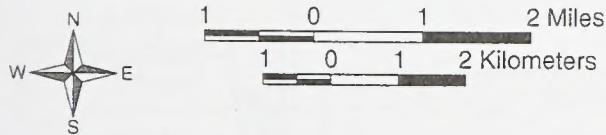
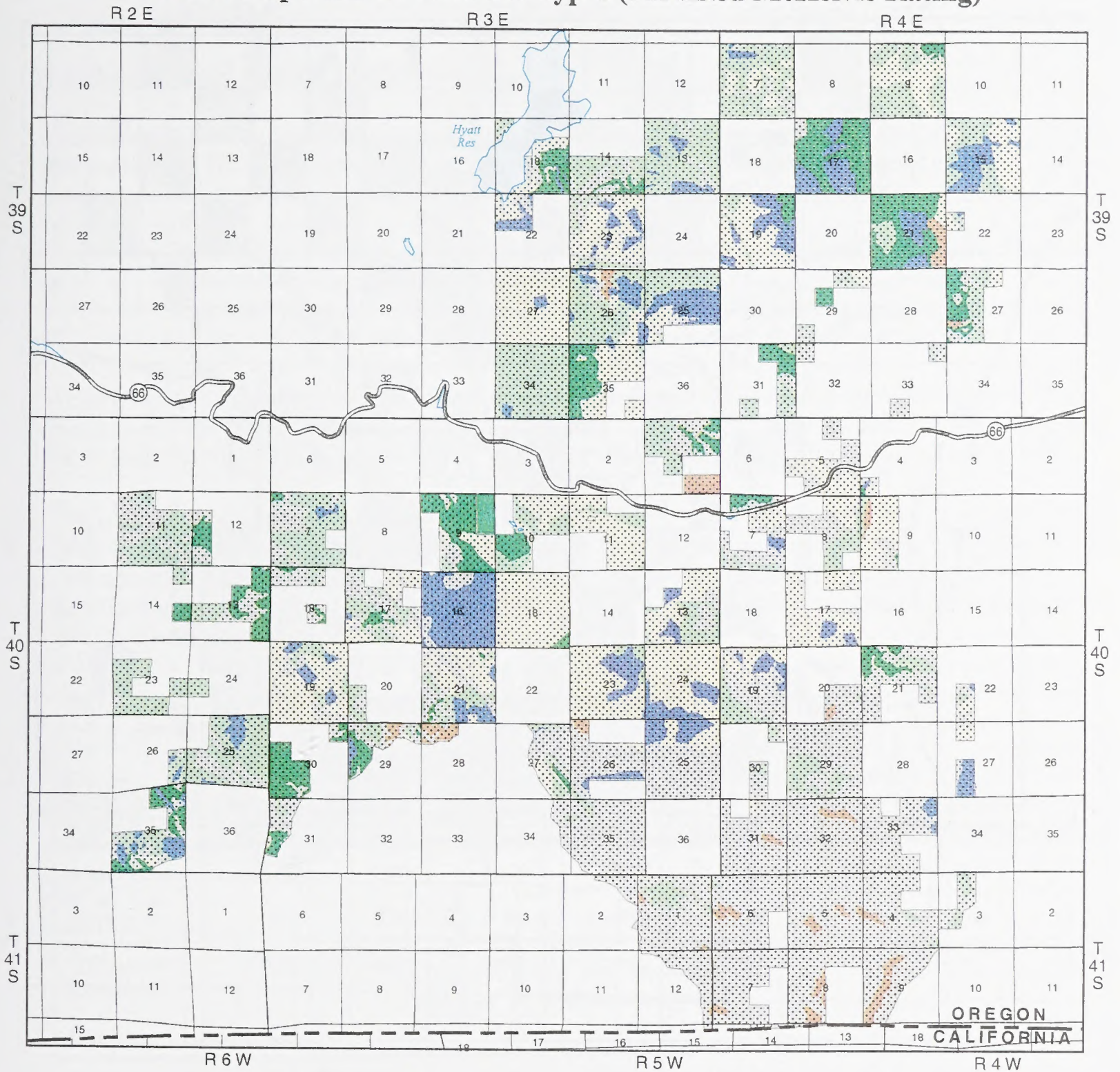
Table 2-5. Acreage of NSO habitat types by ecoregion

Ecoregion	Type 1 Nesting (ac)	Type 2 Roosting/ Foraging	Type 3 Young Stands	Type 4 No Potential	Type 5 Dispersal with Potential	Type 6 Dispersal with no Potential	Total Acres	Current and Potential NSO Habitat Types (1+2+3+5)
SISKIYOU FOOT- HILLS (78b)	949	2,115	416	1,530	711	58	5,779	4,191
<i>Percent</i>	16.4%	36.6%	7.2%	26.5%	12.3%	1.0%	100.0%	
<i>Current Habitat*</i>	3,064						53.0%	72.5%
<i>Potential Habitat**</i>			→	1,127	←		19.5%	
SOUTH CASCADE SLOPES (9i)	95	462	148	3,737	821	328	5,591	1,526
<i>Percent</i>	1.7%	8.3%	2.6%	66.8%	14.7%	5.9%	100.0%	
<i>Current Habitat</i>	557						10.0%	27.3%
<i>Potential Habitat</i>			→	969	←		17.3%	
KLAMATH (78g) RIVER RIDGES	508	1,257	1,222	5,975	3,237	219	12,418	6,224
<i>Percent</i>	4.1%	10.1%	9.8%	48.1%	26.1%	1.8%	100.0%	
<i>Current Habitat</i>	1,765						14.2%	50.1%
<i>Potential Habitat</i>			→	4,459	←		35.9%	
SOUTHERN CASCADES (4g)	1,580	3,559	1,413	932	2,544	191	10,219	9,096
<i>Percent</i>	15.5%	34.8%	13.8%	9.1%	24.9%	1.9%	100.0%	
<i>Current Habitat</i>	5,139						50.3%	89.0%
<i>Potential Habitat</i>			→	3,957	←		38.7%	
LSR TOTAL (AC)	3,132	7,393	3,199	12,174	7,313	796	34,007	21,037
<i>Percent</i>	9.2%	21.7%	9.4%	35.8%	21.5%	2.3%	100.0%	
<i>Current Habitat</i>	10,525						31.0%	61.9%
<i>Potential Habitat</i>			→	10,512	←		30.9%	

* Current/NSO Suitable Habitat: Existing NSO nesting, roosting and foraging (NRF) forest habitat includes NSO Habitat Types 1 & 2.

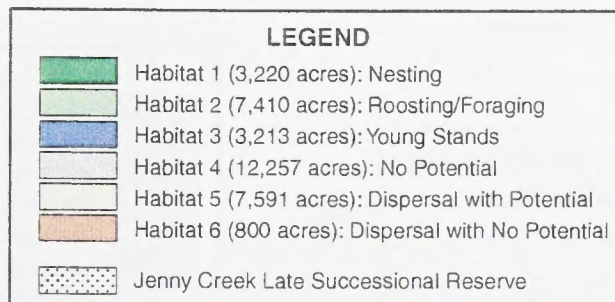
** Potential/NSO Potential Habitat: Includes both current suitable habitat and forest with potential to develop into suitable habitat and includes NSO Habitat Types 1, 2, 3 and 5.

Jenny Creek Late Successional Reserve Northern Spotted Owl Habitat Types (Modified McKelvie Rating)



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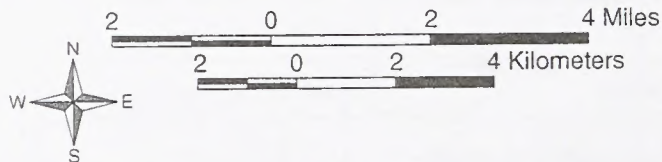
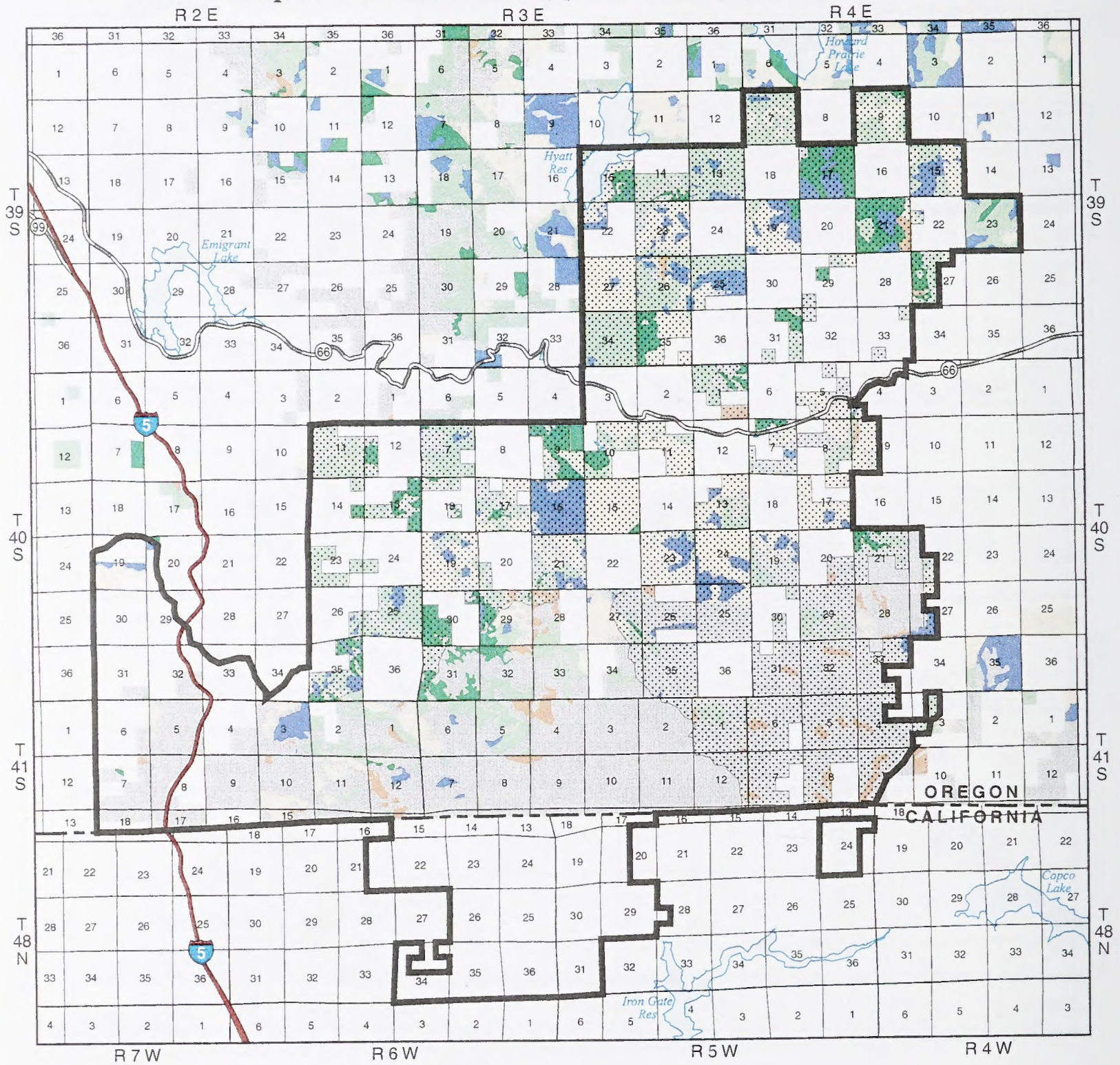
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MAP 2-5

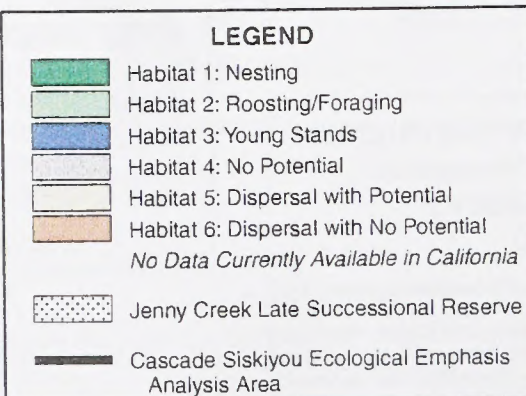
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Jenny Creek Late Successional Reserve Northern Spotted Owl Habitat Types (Modified McKelvie Rating)



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MAP 2-6

D03-02-00:JR

Landscape Level Habitat Information

Private lands were not included in the habitat classification because inventory data on those lands was not available. The assumption is the privately held lands will continue to be managed on a short rotation basis that will prevent the development of LSOG habitat conditions on those lands.

- There are 66,743 total gross acres (all ownerships) within the Jenny Creek LSR of which BLM manages 34,007 acres (51 percent).
- NSO NRF potential habitat is 21,037 acres of the gross acreage (32 percent).
- Current NSO NRF habitat is 10,525 acres of the gross acreage (15 percent).

Analysis of the amounts of the six habitat types was performed at two scales in order to put the LSR into a somewhat larger ecological context (Table 2-6). One was just the LSR acres and the second is BLM lands within a 2-mile wide zone or "doughnut" surrounding the LSR designated lands.

The LSR landscape is not expected to ever approach the appearance of a contiguous block of LSOG habitat. However, that condition is not necessary to meet the conservation goals for which the LSR was established. Table 2-6 shows much of the land designated as LSR, or the "dough-nut" surrounding the LSR, is not capable of supporting the LSOG/ NSO NRF habitat for LSOG associated species intended to benefit from the LSR designation.

Table 2-6. Current NSO habitat acreage within and around the Jenny Creek LSR

Current NSO Habitat	Type 1 Nesting	Type 2 Roosting/ Foraging	Type 3 Potential Habitat Only	Type 4 No Potential	Type 5 Dispersal with Potential	Type 6 Dispersal with no Potential	Total Acres	Existing NSO Habitat 1&2
Within LSR	3,132	7,393	3,199	12,174	7,313	796	34,007	10,525
Percent	9%	22%	9%	36%	22%	2%	100%	31%
"Dough-nut" around LSR	1,026	4,495	3,054	12,396	3,347	381	24,699	5,521
Percent	4%	18%	12%	50%	14%	2%	100%	22%
Total Inside & Outside	4,246	11,905	6,267	24,653	10,938	1,181	59,190	16,151
Percent	7%	20%	11%	42%	18%	2%	100%	27%

Current Conditions by Ecoregion of NSO Habitat Types

Klamath River Ridge Ecoregion (78a)

Habitat Type 1: Nesting

Mixed Conifer Forest stands with LSOG old-growth character are unentered or lightly timber harvested. Two or three age classes are prominent within the multilayered stand. White fir occupies most of the understory in the form of intermediate and suppressed trees. The overstory is primarily large, old sugar pine, ponderosa pine and Douglas-fir. Some larger white fir are found, but are generally smaller and younger than the other species. Douglas-fir dwarf mistletoe is present. Coarse woody debris and snags are not generally lacking although class 1 and 2 snags and coarse woody debris may be low due to the predominance of white fir which rots quickly.

Current risks from stand replacing fires and insects and loss of large tree components.

Habitat Type 2: Roosting/Foraging

Most mixed conifer stands have been entered, a few have a harvest history. LSOG characteristics are present in varying amounts. Gaps exist where large trees have been removed. White fir most commonly fills gaps to the exclusion of pine. Large trees are still present in these stands, however, Quadratic Mean Diameter and stand age is less than in Habitat Type 1. Many residual trees present are over 80 years old and often exceed 250 years of age. Canopy closure has been reduced. Canopy may or may not be single layer, but vertical forest structure is reduced and is more open and discontinuous than in un-entered stands. White fir grow around residual old-growth conifers. Sugar and ponderosa pine vigor is decreased due to white fir competition. Snags and CWD are often deficient due to past logging and yarding practices.

Maintain of roost/forage functions and tree vigor are concerns. Need development of the large tree component. Risk of stand loss to fire and insects.

Habitat Type 3: Potential Habitat Only

Existing young plantations. Needs thinning and individual tree culturing.

Habitat Type 5: Dispersal Habitat with LSOG Potential

Many of these stands were more heavily thinned and often are a result of shelterwood cuts or multiple entries. Some are younger stands or are stocked at lower levels due to disturbance, poor soils or low site forest lands. Canopy cover is limited, little layering exists and understory stocking levels are often poor. CWD and snags are almost always deficient.

Need to restore LSOG functional characteristics. Could accelerate stand development to encourage the creation of roosting/foraging habitat and/or encourage development of vigorous open grown trees that maintain dispersal functions.

Siskiyou Foothills Ecoregion (78b)***Habitat Type 1: Nesting***

Mixed conifer forest stands are unentered or lightly timber harvested. Two or three size and age classes are found in a multistoried stand. There is a significant amount of black oak and madrone in the intermediate canopy level. Hardwoods are often overtopped by large mature conifers such as Douglas-fir, ponderosa pine and incense cedar. Few sugar pine or white fir are found in these stands although some white fir are present as seedlings and intermediate suppressed trees in the understory. Douglas-fir and incense cedar are the most common seedlings and pole sized conifers. Dwarf mistletoe is often heavy on Douglas-fir. Stands occur on steep slopes and display riparian features. CWD and snags are not generally lacking for hardwoods or conifers.

Habitat Type 2: Roosting/Foraging

Most mixed conifer stands have been entered, some have not been managed. LSOG characteristics are present in varying amounts. Gaps exist where large trees have been removed. Douglas-fir is usually filling these gaps. Dwarf mistletoe on Douglas-fir is common and sometimes heavy due to past selective logging practices that opened the stands up. Canopy closure has been reduced. Canopy is generally not single layered although forest structural diversity is reduced, more open and discontinuous than in un-entered stands. Mean diameter is less than in Habitat Type 1. Ponderosa pine and black oak vigor is decreased due to heavy stocking and competition from Douglas-fir and incense cedar. Snags and coarse woody debris are sometimes deficient due to past management practices.

Habitat Type 3: Potential Habitat Only

Most of this habitat is existing young plantations. Needs treatment to encourage LSOG structure over time through thinning and individual tree culture. Hardwoods (black oak and madrone) should be encouraged.

Habitat Type 5: Dispersal Habitat with Potential

Many of these stands were heavily and selectively thinned. These stands are now composed of heavy brush and hardwoods as well as residual conifers. Some stands are younger in age and/or are stocked at lower levels due to disturbance or poor soils. Residual Douglas-fir with dwarf mistletoe were often left in the stand. Canopy cover is limited, generally less than 40% and little layering exists at present. Coarse woody debris and snag numbers are usually limited.

Southern Cascades Ecoregion (4g)***Habitat Type 1: Nesting***

Forest stands are un-entered or lightly timber harvested. The higher elevation stands are composed of almost pure, large old white fir stands. Gaps are common where *Phellinus weirii* has had a historical presence. White fir is filling these gaps as very dense clumps. Many white fir stands are associated with wet alpine meadows. Therefore, patch size may be smaller. Stand density is particularly high in association with meadow edges. White fir stands here have a greater tendency to be even-aged,

single canopy where *Phellinus* is absent. At lower elevations individual large, sugar pine and ponderosa pine are older than white fir because they have remained as a stand component due to the pine's resistance to various root rots. Here sugar pine and ponderosa pine sometimes fills the canopy gaps along with incense cedar as white fir mortality occurs in root rot pockets. Douglas-fir trees are present as well. Douglas-fir dwarf mistletoe is not a factor as in the other ecoregions. Stocking density tends to be greater in the Southern Cascades than in the Klamath Ecoregion. CWD and snags are present in sufficient quantities. *Phellinus weirii* infection creates many snags and much coarse woody debris, although it is sometimes short lived.

Habitat Type 2: Roosting/Foraging

Most stands have been entered, or are younger in age and have smaller trees than Habitat Type 1 stands. Pure white fir stands that have been opened up by thinning suffer from wind throw and pockets of *Phellinus*. Additionally, they often have become infected with Annosus root rot through stumps from previous thinnings. Over time, all of these factors contribute to decreasing stocking levels and canopy cover. Seedling and intermediate tree stocking varies and depends on gap size. Understory stocking levels can be minimal. Intermediate canopy is usually not well developed.

Multi-species stands which includes sugar pine, incense cedar and white fir are more resilient and show some recovery with release of root rot resistant species after harvest. Multi-species composition stands tend to have more developed canopy levels. Stands are approach 60% canopy cover. Canopy gaps are often filled with root rot resistant species. CWD and snags are sometimes deficient in numbers.

Habitat Type 3: Potential Habitat Only

Most of this habitat is existing young plantations. Young plantations in this ecoregion, particularly at the higher elevations, are extremely difficult to regenerate and must be rehabilitated with pine species. CWD and snags are always deficient in these situations because of burning during site preparation after harvest.

Habitat Type 5: Dispersal Habitat with Potential

Forest stands have often been thinned as shelterwoods. Some stands may be open grown, intertwined with meadows or exhibit naturally low stocking levels. Stands are open with little canopy development and have few seedlings due to exposure on cold, harsh sites even though canopy cover is greater than 40%. Root rots are a problem, particularly in stands dominated by white fir. Windfall is common and stands decrease in stocking levels, canopy closure, and complexity over time especially in white fir dominated stands. CWD and snags are deficient due to past logging, yarding, and burning practices.

Southern Cascades Slope Ecoregion (9i)***Habitat Type 1: Nesting***

Stands are ponderosa pine dominated. A mixture of white fir and Douglas-fir understory has developed in the absence of fire. These stands are located on the lee side of the Cascades. They are on very dry sites on generally flat terrain.

Habitat Type 2: Roosting/Foraging

These ponderosa pine dominated stands occur on the lee side of the Cascades. The sites are flat and dry. Douglas-fir and white fir understory has developed in the absence of fire. Overall the stands tend to be more open grown than forest stands in the other ecoregions. Tree diameter is less than in Habitat Type 1. Most of these stands have been entered, a few have not. Canopy closure has been reduced. The canopy may or may not be single layer, however forest cover has been reduced and may or may not be more open and discontinuous than in un-entered stands. CWD and snags are generally deficient due to past logging and yarding practices.

Habitat Type 3: Potential Habitat Only

There are few Habitat Type 3 acres in this ecoregion. Most are young pine plantations. Treatments should be designed to encourage LSOG structure over time through thinning and individual tree culture.

Habitat Type 5: Dispersal Habitat with Potential

Many of these stands are heavily thinned and some were selectively cut. A few are younger stands or are stocked at lower levels due to disturbance, poor soils or are intermixed with natural meadows. Stands are open and canopy cover is generally limited, little layering exists and stocking levels are poor. CWD and snags are generally deficient.

LSOG Forest Stand Tables from NSO Activity Centers

Inventory of the forest tree structure/size productivity measured within NSO Activity Centers within the Jenny Creek LSR. Conifer and hardwood tree data, representative of the old-growth seral stage, is summarized in Table 2-7 through 2-9. The variability of tree sizes is representative of from 3-5 distinct tree layers. Layers generally consisted of a dense lower layer dominated by small tolerant conifers and a multi-layered, uneven aged overstory of conifers, with individual trees which exceed 35 inches DBH. These tables provide a modeling guide to be used during the prescription development process for use within the major plant communities which may vary by aspect and elevation.

Table 2-7. Dry Douglas-fir/pine community – LSOG/NSO Activity Center stand table

Species	Trees per Acre by Species and Size Class (DBH in inches)									
	00-06	07-10	11-14	15-18	19-22	23-26	27-30	31-34	35+	Total
Ponderosa Pine	16.0	39.5	7.7	17.5	10.6	1.1	1.3	1.4	0.0	95.1
Douglas-fir	78.0	54.9	24.6	11.5	8.4	2.4	0.5	0.4	1.1	181.8
Incense Cedar	25.0	0.0	0.0	1.5	1.7	1.1	0.4			29.7
Sugar Pine	0.0	0.0	0.0	4.1	1.6	1.4	0.9		0.8	8.8
White Fir	25.0	0.0	1.0							26.0
Summary	144.0	94.4	33.3	34.6	22.3	6.0	3.1	1.8	1.9	341.4
>10" dbh			33.3	34.6	22.3	6.0	3.1	1.8	1.9	103.0
>19" dbh					22.3	6.0	3.1	1.8	1.9	35.1
>30" dbh								1.8	1.9	3.7

Table 2-8. Mixed conifer plant community – LSOG/NSO Activity Center Stand Table

Species	Trees per Acre by Species and Size Class (DBH in Inches)									
	00-06	07-10	11-14	15-18	19-22	23-26	27-30	31-34	35+	Total
Ponderosa Pine	25.0	0.0	0.0	2.9	3.6	0.6	1.3	0.3	2.3	36.0
Douglas-fir	166.0	47.6	41.6	25.2	11.6	2.5	0.9	0.4	0.9	296.7
Incense Cedar	8.0	4.5	0.0	2.7	4.1	0.6	0.5	0.0	0.8	21.2
Sugar Pine	4.0	0.0	4.4	1.6	0.0	0.0	0.0	0.0	0.0	10.0
White Fir	29.0	0.0	8.7	0.0	0.8	0.0	0.0	0.0	0.0	38.5
California Black Oak	45.0	0.0	8.4	3.7	0.0	0.0	0.0	0.0	0.0	57.1
Summary	277.0	52.1	63.1	36.1	20.1	3.7	2.7	0.7	4.0	459.5
>10" dbh			63.1	36.1	20.1	3.7	2.7	0.7	4.0	130.4
>19" dbh					20.1	3.7	2.7	0.7	4.0	31.2
>30" dbh								0.7	4.0	4.7

Table 2-9. White fir plant community – LSOG/NSO Activity Center stand table

Species	Trees per Acre by Species and Size Class (DBH in Inches)									
	00-06	07-10	11-14	15-18	19-22	23-26	27-30	31-34	35+	Total
Ponderosa Pine	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.3	0.7
Douglas-fir	33.0	0.0	7.7	2.9	0.8	0.6	0.0	0.3	2.5	47.8
Incense Cedar	0.0	8.1	4.1	0.0	0.0	0.0	1.4	1.1	0.3	15.0
Sugar Pine	0.0	0.0	0.0	1.7	0.0	0.7	0.4	0.7	1.6	5.1
White Fir	132.0	32.7	21.0	17.5	9.2	7.3	3.6	2.0	4.4	229.7
Summary	165.0	40.8	32.8	22.1	10.0	8.6	5.8	4.1	9.1	298.3
>10" dbh			32.8	22.1	10.0	8.6	5.8	4.1	9.1	92.5
>19" dbh					10.0	8.6	5.8	4.1	9.1	37.6
>30" dbh								4.1	9.1	13.2

SNAGS AND COARSE WOODY DEBRIS

Large (greater than 16 inches in diameter) coarse woody debris are important distinguishing features within LSOG forests. Many LSOG associated species wildlife species are recognized as associated with both vertical (snags) and down (CWD) woody debris. The occurrence of woody debris in forest ecosystems is quite variable and may happen in a number of ways. Over time, mortality of individual trees or waves from disturbance events, such as windthrow, insects, disease, and wildfire, occur. Retention of snags and down woody debris is dependent on fire frequency and fire intensity, and on their decomposition rates. Comparison of stand age to decay class from previous stands suggests that decomposition rates for large logs is about 80-100 years from Class 1 (recent dead) to Class 5 (advanced decay). Alternating warm/moist with warm/dry conditions favors fast decomposition rates. Smaller CWD materials (less than 16 diameter) may be important for roosting and dispersal habitat and these sizes are also presented in the following tables.

Snags

During the summer of 1998, sixteen 100-acre NSO Activity Centers in the LSR were sampled for snags. With the exception of one activity center, 1,500 feet of fixed width (66 feet) belt transect were run in each activity center (approximately 2.27 acres of transect area per 100-acre activity center). The exception was one stand with only 1,300 feet sampled. Density calculations for this site were adjusted accordingly. Only those snags greater than 8" dbh were included in this analysis. The assumption is the NSO Activity Centers represent the most functional LSOG habitat in the LSR.

The 16 NSO sites in the LSR are distributed quite evenly among the ecoregions with five sites in each of the three major ecoregions within the LSR (Siskiyou Foothills, South Cascades, and Klamath River Ridges) and one site in the minor South Cascade Slopes Ecoregion. (See Map 4-7 for NSO Activity Centers and ecoregions within Jenny Creek LSR)

The stand structure inventory recorded a total of 401 snags greater than 7.9" diameter at breast height (dbh). The snags were assigned to 5 decay classes in the field and to 14 dbh size classes during the analysis phase, see Appendix H. Descriptive statistics were calculated for the three major ecoregions within the LSR: Siskiyou Foothills, South Cascades, and Klamath River Ridges. (South Cascade Slopes Ecoregion contained only one NSO site. Consequently no descriptive statistics were calculated based on the data collected there.)

Snag densities observed by species and size classes within 100-acre spotted NSO centers sampled by ecoregion are presented in Tables 2-10 through 2-15 displaying mean snags, densities, +1 stand deviation to provide an estimate of target desired levels, decay classes and species data.

Table 2-10. Observed snags per acre within NSO Activity Centers in the Siskiyou Foothills Ecoregion (78b) - (5 sample sites)

Size Class (DBH)	Mean Snags Per Acre	Sample Standard Deviation	Mean Snags + one Standard deviation	Observed Range
8-15.9	4.58	2.70	7.35	1.3-7.9
16-17.9	0.5	0.48	0.98	0-1.3
18-19.9	0.24	0.22	0.46	0-0.4
20-21.9	0.26	0.40	0.66	0-0.9
22-23.9	0.08	0.18	0.26	0-0.4
24-25.9	0.16	0.22	0.38	0-0.4
26-27.9	0.08	0.18	0.26	0-0.4
28-29.9	0.08	0.18	0.26	0-0.4
30-31.9	0	0	0	0-0
32-33.9	0.16	0.22	0.38	0-0.4
34-35.9	0.16	0.22	0.38	0-0.4
36-39.9	0.08	0.18	0.26	0-0.4
40-49.9	0.08	0.18	0.26	0-0.4
50+	0	0	0	0
8"+	6.46	5.36	11.89	
16"+	1.88	2.66	4.54	
20"+	1.14	1.96	3.1	

Mean snags per acre 6.6 (n = 5 sites)

Sample standard deviation of snag density 3.80 (n = 5 sites)

Snag density at most snag-rich site 10.6 per acre.

Snag density at snag-poorest site 1.8 per acre.

Table 2-11. Distribution of 16"+ dbh snags by decay class and species within Siskiyou Foothills Ecoregion

Decay Class	Percent Observed		Snag Species	Percent Observed
1	21.7		Sugar Pine	0.0
2	8.7		Ponderosa Pine	13.0
3	26.1		White Fir	26.1
4	26.1		Douglas-fir	52.2
5	17.4		Incense Cedar	4.3
	100.0		Black Oak	4.4

Table 2-12. Observed snags per acre within NSO Activity Centers in the Southern Cascades Ecoregion (9i) - (5 sample sites)

Size Class (DBH)	Mean Snags Per Acre	Sample Standard Deviation	Mean Snags + one Standard Deviation	Observed Range
8-15.9	7.96	6.16	14.12	2.2-17.0
16-17.9	1.08	0.93	2.01	0.4-2.2
18-19.9	0.92	0.70	1.70	0-2.0
20-21.9	0.28	0.41	0.69	0-0.9
22-23.9	0.44	0.32	0.76	0-2.0
24-25.9	0.46	0.48	0.94	0-1.0
26-27.9	0.44	0.62	1.06	0-0.3
28-29.9	0.78	0.77	1.55	0-0.4
30-31.9	0.26	0.40	0.66	0-0.9
32-33.9	0.44	0.32	0.76	0-0.9
34-35.9	0.34	0.19	0.53	0-0.4
36-39.9	0.88	0.66	1.54	0-1.8
40-49.9	0.34	0.37	0.71	0-0.9
50+	0.52	0.48	1.00	0-1.3
8"+	15.14	12.81	28.03	
16"+	7.18	6.65	13.91	
20"+	5.18	5.02	10.2	

Mean snags per acre 15.20 (n = 5 sites)

Sample standard deviation of snag density 5.73 (n = 5 sites)

Snag density at most snag-rich site 24.5 per acre

Snag density at snag-poorest site 10.1 per acre

Table 2-13. Distribution of 16"+ dbh snags by decay class and species within Southern Cascade Ecoregion

Decay Class	Percent Observed		Snag Species	Percent Observed
1	38.8		Sugar Pine	3.8
2	27.5		Ponderosa Pine	12.5
3	8.7		White Fir	57.5
4	18.8		Douglas-fir	17.5
5	6.3		Incense Cedar	8.8
	100.1		Black Oak	0.0

Table 2-14. Observed snags per acre within NSO Activity Centers in the Klamath River Ridges Ecoregion (78g) - (5 sample sites)

Size Class (DBH)	Mean Snags Per Acre	Sample Standard	Mean Snags + one Standard Deviation	Observed Range
8-15.9	7.02	2.26	9.28	5.2-10.5
16-17.9	1.48	0.65	2.13	2.6-0.9
18-19.9	0.78	0.64	1.42	0-1.7
20-21.9	0.88	0.53	1.41	0-1.3
22-23.9	0.60	0.50	1.10	0-1.3
24-25.9	0.86	0.53	1.39	0.4-1.8
26-27.9	0.50	0.48	0.98	0-1.3
28-29.9	0.34	0.56	0.90	0-1.3
30-31.9	0.70	0.50	1.20	0-1.3
32-33.9	0.18	0.40	0.58	0-0.9
34-35.9	0	0	0	0
36-39.9	0.26	0.40	0.66	0-0.9
40-49.9	0.24	0.22	0.46	0-0.4
50+	0.08	0.18	0.26	0-0.4
8"+	13.92	7.85	21.77	
15"+	6.9	5.59	12.49	
20"+	4.64	4.3	8.94	

Mean snags per acre 14.10 (n = 5 sites)

Sample standard deviation of snag density 2.94 (n = 5 sites)

Snag density at most snag-rich site 17.2 per acre

Snag density at snag-poorest site 9.7 per acre

Table 2-15. Distribution of 16"+ dbh snags by decay class and species within Klamath River Ridges Ecoregion

Decay Class	Percent Observed		Snag Species	Percent Observed
1	38.0		Sugar Pine	5.1
2	22.8		Ponderosa Pine	3.8
3	11.4		White Fir	62.0
4	15.2		Douglas-fir	19.0
5	12.7		Incense Cedar	10.1
	100.1		Black Oak	0.0

Coarse Woody Debris

Coarse woody debris (CWD, i.e., down logs) has been identified as a key component of late-successional forests in the NFP/ROD. This material performs many functions including providing foraging habitat for small, medium, and large mammals and many species of birds and invertebrates. Coarse woody debris also provides denning sites and hiding cover for most terrestrial vertebrates dwelling on the forest floor.

Large materials (e.g., coarse woody debris, stems, large branches) are important for healthy soil biology because they influence soil nutrient availability, soil moisture, and population levels of soil organisms. Soil organisms interact with each other and their environment while playing a fundamental role in many site processes. Soil organisms promote carbon cycling, nutrient transfer, water availability, vegetation vigor, and maintenance of soil structure. Most biological fixation of nitrogen in ecosystems occurs because of soil organism activity. Mycorrhizal fungi increase the absorbing surface area of roots, which directly increases the total soil volume that can be explored for nutrients and water. Mycorrhizal fungi and other microbes effect soil structure by helping bind soil particles into water-stable aggregates which, in turn, create soil volume with stable and adequate pore space. Soil pores are essential for adequate movement of water and air required by plants and soil organisms (ROD p.109). Many forest dwelling wildlife species depend on soil organisms and/or fungi for food sources.

Coarse woody debris information was collected in the four ecoregions of the Jenny Creek LSR. These sampling sites were located in NSO Activity Centers which represent undisturbed or lightly disturbed forest stands and provide current status of coarse woody debris in these mature stands. Sampling along transects was conducted on five sites in each of the respective ecoregions except for the Southern Cascade Slopes which only had one site. As a result of not having an adequate number of transects in the Southern Cascade Slopes (9i) Ecoregion, the target density for that ecoregion will be the same as the near by Klamath River Ridges Ecoregion which is similar in elevation and plant association. Based on the current information, levels for coarse wood in the respective ecoregions

were calculated. Table 2-16 display the amount of coarse woody debris by ecoregion that is 16 inches in diameter (large end) and at least 16 feet in length in decay class 1 or 2 (ROD definition). Table 2-16 also displays current average numbers of snags available for future coarse wood recruitment.

In the summer of 1998, a series of coarse woody debris measurement transects was run in the LSR. The areas sampled were the 100-acre NSO areas. The intent was to get a sample of the "best" habitat. The assumption was made that the NSO Activity Centers represent the functional LSOG habitat in the LSR. At the time of this writing, eight activity centers had been sampled. A total of 11,800 feet of transects were run in the 8 NSO Activity Centers. Only logs that are greater than 16 inches in diameter at the large end and at least 16 feet long are considered to be coarse woody debris (NFP C-40). Results of sampling the 100-acre NSO Activity Centers is given in Table 2-17.

Table 2-16. Coarse woody debris by decay class measured in NSO Activity Centers¹ (8 activity centers sampled)

Large End Diameter (inches)	Mean number of logs and Mean number linear feet per acre										Total Mean Number of Pieces and Feet	
	Decay Class 1		Decay Class 2		Decay Class 3		Decay Class 4		Decay Class 5			
	Logs #	linear ft	Logs #	linear ft	Logs #	linear ft	Logs #	linear ft	Logs #	linear ft		
16-27	0.5	21'	0.8	31'	0.3	17'	0.5	23'	0.2	6'	2.3	98'
28-39	0.0	4'	0.2	11'	0.2	13'	0.3	8'	0.1	4'	.8	40'
40+	0.0	6'	0.1	04'	0.1	10'	0	2'	0	0'	.2	22'

¹In Table 2-16, there is a "0" for the average number of pieces per acre, but a value for the number of linear feet per acre is given. This apparent inconsistency is due to averaging and rounding.

Most of the CWD in the NSO Activity Centers is in the older decay classes. There is some very large wood in the NSO Activity Centers that is larger than 16" on the large end. These large pieces are extremely valuable components of the ecosystem. They perform all of the functions of CWD and do it better and longer than smaller logs.

Table 2-17. Summary of observed coarse woody debris within NSO Activity Centers by ecoregions

Ecoregion	Down Coarse Wood Debris >16"dia. & >16' Decay Classes 1 or 2 (Ave. # pieces/acre)	Standing snags >16"dia. & >16' (Ave. # snags/acre)
Siskiyou Foothills (78b)	1.4	1.9
Southern Cascades (4g)	4.2	7.2
Klamath River Ridges (78g)	5.2	6.9

SPECIAL STATUS PLANT SPECIES

Special status plant species known to occur in the Jenny LSR are associated with vernal moist habitats that are not directly associated with LSOG habitat, with the exception of greenflower wild-ginger. Habitats include vernal pools, wet meadows, and streamside riparian situations. These unusual habitats are a small fraction of Jenny Creek LSR. Although fire has played a role in the maintenance of these habitats, geology, soils, and hydrology are the most important factors. The habitats and species are most at risk from alteration of hydrology by development and logging on nearby private lands, OHV use, and herbivory and trampling by ungulates. See Map 2-7 for location of some special plant communities.

Survey and Manage Species

Vascular Plant Species

Two Survey and Manage species from the Northwest Forest Plan, *Cypripedium fasciculatum* and *C. montanum*, are known to be in or near the Jenny Creek LSR and are associated with LSOG habitats. Management protocols are being developed for both species with recommendations for habitat maintenance and long-term species survival.

A population of two *Cypripedium montanum* plants is known from the Jenny Creek LSR growing in a partial cut late mature white fir forest on the edge of a clearcut. Another small population of three *C. montanum* plants occurs just outside the LSR in a mixed conifer mid-seral white fir forest. The species was collected in 1923 at Johnson Prairie to the east of the Jenny Creek LSR.

Two populations of *C. fasciculatum* have been located in the LSR. One vigorous population of 14 plants occurs in a mixed conifer-madrone stand on a steep slope above Emigrant Creek. The other population of 23 plants grow in a late mature Douglas-fir forest near the edge of a clearcut in the Lincoln Creek drainage. *Cypripedium fasciculatum* was also collected in 1923 at Johnson Prairie.

Non-Vascular Plant Species and Habitats within the LSR – Lichens and Fungi

The Jenny Creek LSR was surveyed for lichens and spring fungi from March 1998 through June 1998 (Appendix B). The area still needs to be surveyed for fall fungi. These surveys are projected for October and November 1999. As of July 1, 1998, a total of nine species of Survey and Manage lichens have been located within the confines of the Jenny Creek LSR. All of these species, with the exception of *Phycotonis ericetorum*, occur below 4,000 feet in elevation and are restricted to riparian zones or to the ecotone between the riparian zones and the adjacent plant associations. Suitable substrates for these species include: California black oak (*Quercus kelloggii*), Oregon white oak (*Quercus garryana*), and Bigleaf maple (*Acer macrophyllum*). These species are occasionally observed on older specimens of Pacific madrone (*Arbutus menziesii*), but the exfoliating nature of the bark makes this tree a less than desirable substrate. Other less important substrates that occupy the true riparian zone include: Pacific flowering dogwood (*Cornus nuttallii*), Hazel (*Corylus cornuta*), and specimens of Douglas-fir (*Pseudotsuga menziesii*).

Lobaria hallii populations, within the Ashland Resource Area, have been most frequently observed occupying the lower branches of white oak stems although LOHA is also known to occur on bigleaf maple and black oak stems in northern California. *Phycotonis ericetorum* is associated with rotting conifer logs and is not restricted to the riparian zone. The seven remaining lichen species occur on all of the previously mentioned substrates and are often associated with one another.

Baldy Creek and Emigrant Creek contain the only major concentration of lichen populations within the confines of the Jenny Creek LSR. *Lobaria hallii* is the only Survey and Manage strategy 1 lichen species known to occur in the LSR, located at one area in Baldy Creek and two locations along Emigrant Creek.

Special Status Species

Vascular Plant Species and Habitats within the LSR Associated with LSOG Habitat

Bureau Watch Species

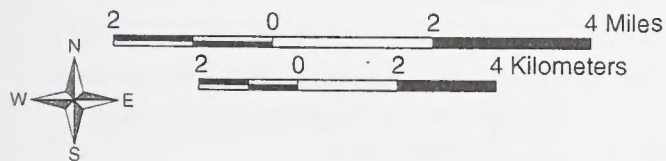
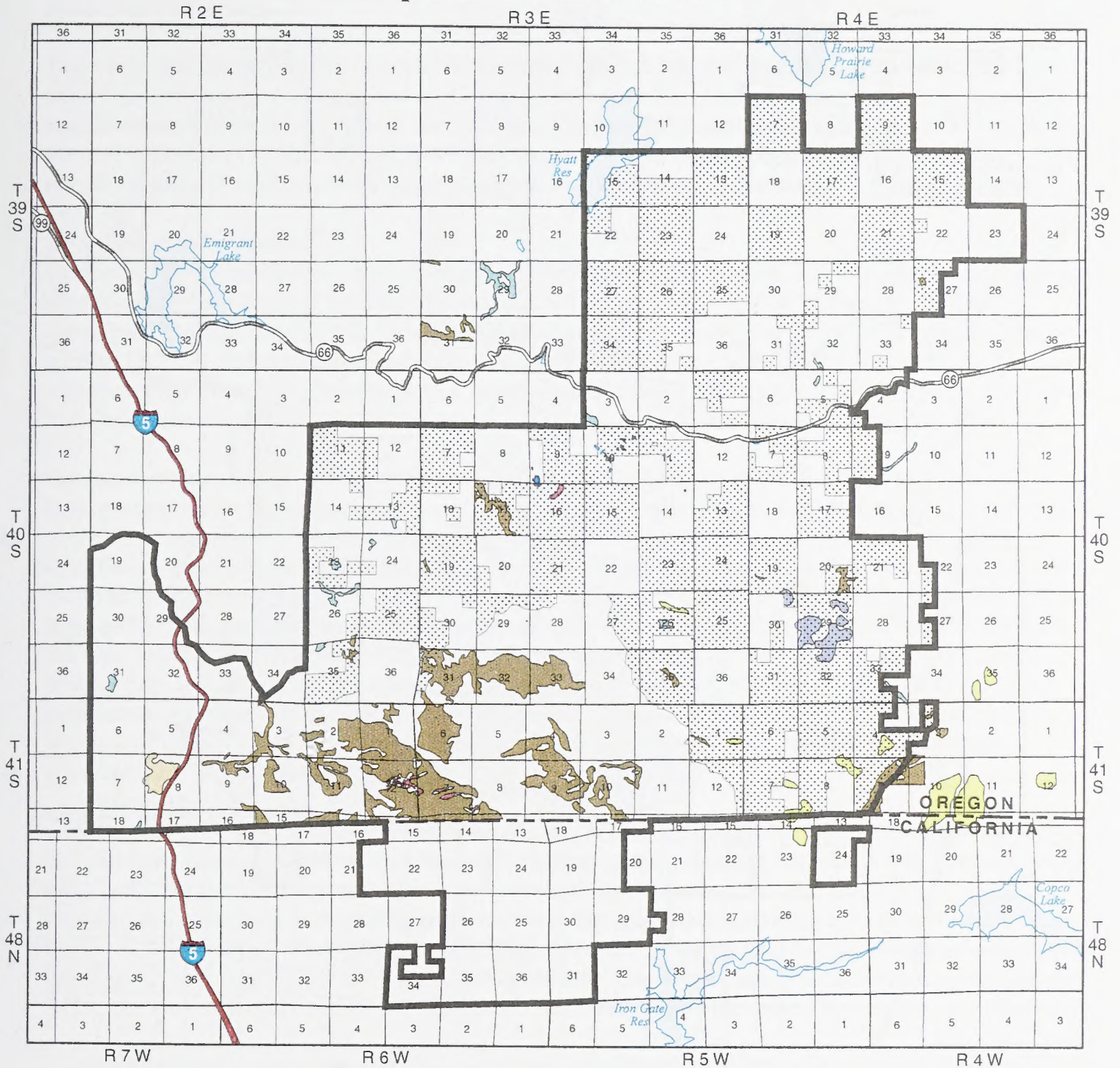
Greenflower wild-ginger (*Asarum wagneri*), a Bureau Watch species, is represented in the LSR by a single population of approximately 300 plants on Chinquapin Mountain. The population is growing along the edge of a white fir/creeping snowberry association in partial shade. The species is known from a number of sites to the north on Medford District and U.S. Forest Service lands.

Vascular Plant Species and Habitats within the LSR Not Associated with LSOG Habitat

Federally Listed

Gentner fritillaria (*Fritillaria gentneri*) might be present in the Jenny Creek LSR. This species is found in the Soda Mountain Wilderness Study Area west of the LSR. The U.S. Fish and Wildlife Service is in the process of listing the species as endangered.

Jenny Creek Late Successional Reserve Special Plant Communities



U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Medford District
2000

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LEGEND

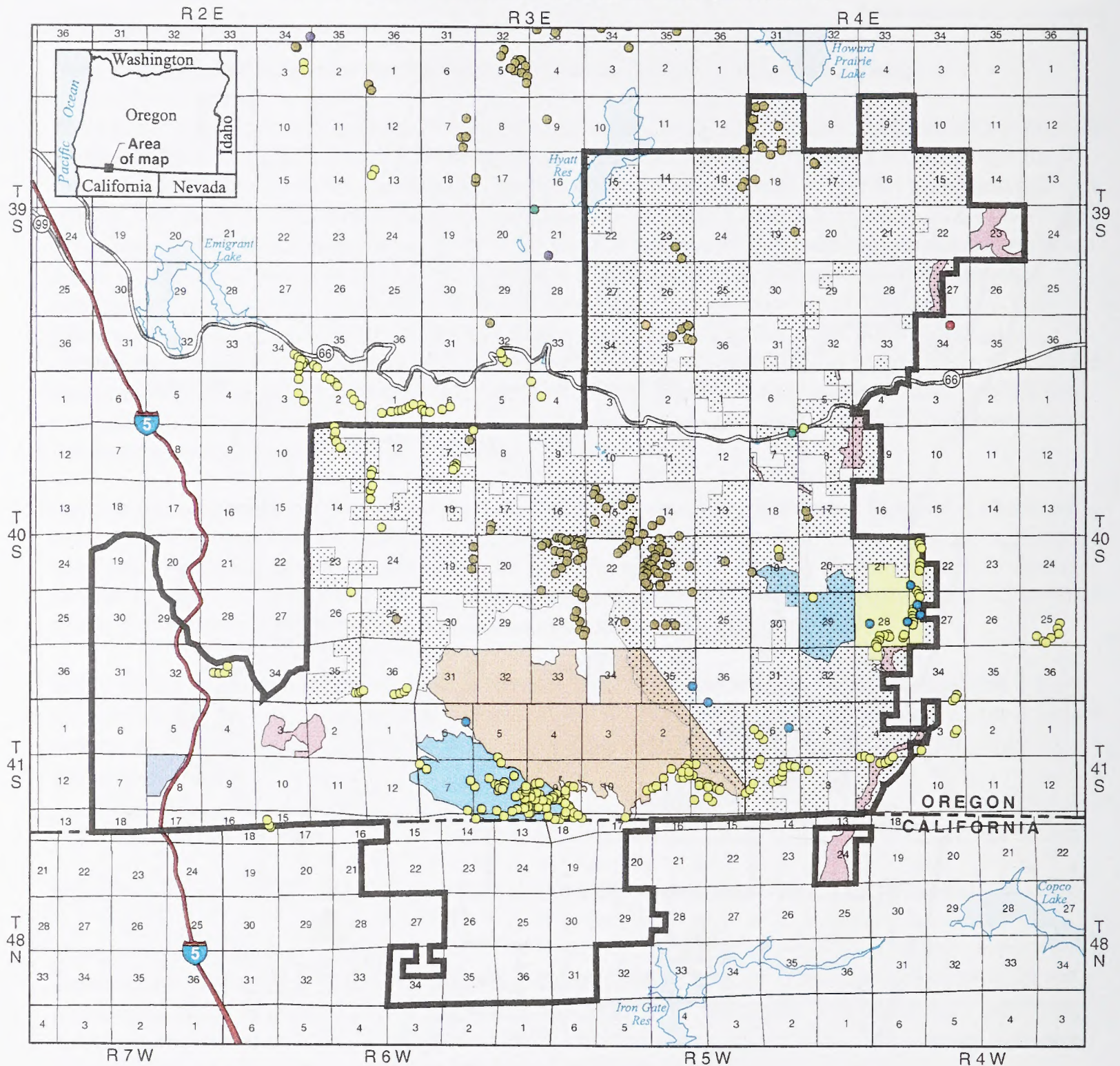
- Special Plant Communities
 - Pond
 - Wet and Semi-Wet Meadows
 - Biscuit Scablands
 - Rosaceous Chaparral
 - Oak Woodland with High-Density Mariposa Lily
 - Mixed Conifer with Sugar Pine Overstory
 - Oak-Juniper Mix
 - No Data Currently Available in California
- Impoundments
- Jenny Creek Late Successional Reserve
- Cascade Siskiyou Ecological Emphasis Analysis Area



MAP 2-7

D03-02-00:JR

Jenny Creek Late Successional Reserve Noxious Weed Identification and Locations



U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Medford District
2000

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- Noxious Weeds**
- Canada Thistle
 - Dalmatian Toadflax
 - Diffuse Knapweed
 - Dyers Woad
 - Meadow Knapweed
 - Spotted Knapweed
 - Yellow Starthistle

— Cascade Siskiyou
Ecological Emphasis
Analysis Area

LEGEND

- Special Management Areas**
- Area of Critical Environmental Concern
 - Box-O Ranch
 - Mariposa Lily Preserve
 - Research Natural Area
 - Wilderness Study Area
 - No Data Currently Available in California
 - Jenny Creek Late Successional Reserve

MAP 2-8

Eight rare species are known to occur in the Jenny Creek LSR, but do not grow in LSOG habitat: Siskiyou fritillary (*Fritillaria glauca*), Greene's mariposa lily (*Calochortus greenei*), Bellinger meadowfoam (*Limnanthes flocosa* var. *bellingermana*), slender nemacladus (*Nemacladus capillaris*), Howell false-caraway (*Perideridia howellii*), coralseed allocarya (*Plagiobotrys figuratus* ssp. *corallicarpus*), Dwarf isopyron (*Isopyron stipitatum*), and Baker globe mallow (*Iliamna bakeri*).

Bureau Sensitive Species

According to ONHP (1996), three species (coralseed allocarya, Greene's Mariposa lily, and Bellinger meadowfoam) are Federal Species of Concern (SoC) listed by ONHP as Category 1 and are considered Bureau Sensitive in Oregon (BSO). Baker globe-mallow is listed as an ONHP Category 1 species (BAO). For these species where lands administered by the BLM or action have a significant effect on their status, it is Bureau policy the district will protect, manage, and conserve those species and their habitats such that any Bureau action will not contribute to the need to list these species.

Limnanthes flocosa var. *bellingermana* occupies a special habitat associated with high winter and spring water tables and impervious basalt subsoil layer. Soils are wet for three or more months of the year. Plants grow in or near the edges of vernal pools. This plant is a narrow endemic found on impervious basalt areas from Poverty Flat Area of Critical Environmental Concern (ACEC) in the Butte Falls Resource Area (BLM), in the vicinity of Lincoln, and at Oregon Gulch Research Natural Area (RNA) on land designated as Jenny Creek LSR. The site near Lincoln is of historic interest as the type locality for the species (the place where the designated nomenclatural type was collected). Southworth and Seevers (1997) propose that Bellinger meadowfoam be returned to species status (*Limnanthes bellingermana* Peck). Their conclusion is based on morphological evidence and the absence of intermediate forms when distributions were sympatric with woolly meadowfoam (*Limnanthes floccosa* var. *floccosa*).

Calochortus greenei is a large attractive mariposa lily that grows only in southern Jackson County and northern Siskiyou County, California. Its habitat is open thickets associated with Oregon white oak. Soils are usually deep and high in clay content. The species is at risk from horticultural collection and grazing pressure from deer, rabbits and livestock; respectively by order of threat. Cattle grazing, when properly managed, does not appear to be a threat; however, uncontrolled grazing can severely impact the species (Brock 1988). There are populations in the Oregon Gulch RNA, the Box O Ranch, and in the oak woodlands on Agate Flat in the LSR.

Coralseed allocarya (*Plagiobotrys figuratus* ssp. *corallicarpus*) in the LSR grows in an open vernal creek near Lincoln. The Lincoln population is unusual for its size, and isolation from other known populations at Sams Valley north of Medford. Interference with surface hydrology would put the population at risk.

Bureau Assessment Species

Four species, Baker globe-mallow, slender nemacladus, Siskiyou fritillary, and dwarf isopyron, are ONHP Category 2 species. They are Bureau Assessment Species (BAO). These are species that need protection or mitigation in BLM activities.

The dwarf isopyron (*Isopyron stipitatum*) population consists of 700 individuals. The plants are growing on the edge between a rocky meadow and a mixed conifer forest.

Nemacladus capillaris is represented by several populations in the LSR. Slender nemacladus is often associated with dry, rocky areas.

Baker globe-mallow (*Iliamna bakeri*) is known from three populations in the LSR, totaling 12 individuals. They are associated with clearcuts and rock outcrops.

Siskiyou fritillary (*Fritillaria glauca*) is known from a single population in a rocky area near a rock pit on the Klamath Ridge crest west of Soda Mountain.

Bureau Watch Species

Green-flower wild-ginger and Howell false-caraway are ONHP Category 4 (no Category 3 species are known from Jenny Creek LSR) species. These are Bureau Watch Species (BWO) that currently appear to be stable, but may become threatened in the foreseeable future.

A diminutive annual monkey-flower, *Mimulus pygmaeus*, with a very rapid spring life cycle, was formerly given protection. However, it was found to be very common through the main part of its range outside the LSR. The Oregon Natural Heritage Program recently dropped it from its list (ONHP 1998).

Greenflower wild-ginger (*Asarum wagneri*) is represented in the LSR by a single population of approximately 300 plants on Chinquapin Mountain. The population is growing along the edge of a white fir/creeping snowberry association in partial shade.

Howell false-caraway (*Perideridia howellii*) is found in vernal moist, wet meadows and in riparian habitats along streams. There are a number of populations on the district. There are several populations in the Oregon Gulch RNA.

ALIEN PLANTS AND NOXIOUS WEEDS

Alien Plants

Alien (non-native) plant species are common within the Jenny Creek LSR. See Map 2-8 for identified locations of noxious weeds. Some alien species can be desirable for reasons such as erosion control after disturbance while waiting for native species to gradually reestablish themselves. Some, such as timothy grass, are simply present and are relatively neutral; while others, such as the Himalayan blackberry, can quickly dominate and out-compete native species.

Many alien species have root systems capable of drawing soil moisture quickly, but are also able to prevent erosion by holding the soil in place. Some species are poisonous to wildlife, livestock and humans. Other non-native annual grasses can quickly dominate and out-compete native species.

Plants that cause great ecological and economic damage have been designated as noxious weeds. Their impact can be so great that their control has been legislated.

Most alien species can potentially displace native species, alter native plant and animal habitats, and alter ecological processes in plant and animal communities. They can compete with native species for water and nutrients, are often early and prolific seeders, and may produce fruits capable of long distance dispersal by various means, such as wind, water, or animal transport. Some are distributed by being caught-up in fur or hooves, clothes or vibram soles, or by propagules in mud or vegetation that cling to motor vehicles (bumpers, tires) and can quickly spread to newly disturbed areas or even invade relatively undisturbed sites.

Generally, alien species on the Jenny Creek LSR are European, Asian, or Eurasian in origin and co-evolved with humans and their activities in climate regimes similar to local climates. These species thrive under disturbed conditions. Large populations of exotic species are often present in open, disturbed areas at lower elevations; especially in dry meadows, oak and shrub communities, open pine savanna, and to a minor degree in wet meadows. Once disturbed, these communities are quickly invaded by non-native species from outside seed sources or the soil seed bank. Native grasses and forbs often have great difficulty competing with the non-native species that germinate in the fall and are able to out-compete the natives species for moisture in soils that are shallow or have limited moisture holding capacity.

Non-native species are generally absent in undisturbed coniferous mixed conifer or white fir forests at higher elevations except in canopy light gaps: roadsides, recreation sites, harvested timberlands, etc. However, several species of thistle and mullein are common in disturbed areas at higher elevations; aggressive non-native grasses may pose a problem as a result of attempting to create open "park-like" areas in stands of conifers, especially at higher elevations where low intensity fires have been suppressed and pre-historically had been the norm. Sedge and rush dominated wet meadows tend to be more resistant to an invasion by non-native species. Exceptions are occasional occurrence of those species which are adapted to wet soils associated with ponds, ditches, or open riverine systems, such as portions of the Parsnip Lakes or Jenny Creek.

Starting in 1946, the United States Forest Service initiated a grass re-seeding program on cut over timber lands which changed the vegetative history of federal timbered lands. With each successive year, cut over areas were stabilized by seeding and the rangelands were also improved by this effort. A 1957 land exchange between the USFS and the BLM included acreage within the LSR boundary north of Dead Indian Highway. These were lands included in the initial efforts to reseed and stabilize cut over timber lands. The Forest Service success was imitated by the Bureau of Land Management (BLM) with the first seeding effort in 1951.

A Medford Mail Tribune news release dated October 3, 1941 credits the O & C Revested Lands Administration and the Range Development Service as two Department of Interior agencies ready to carry out an extensive range development program on grazing and brush lands if the trial grassland

re-seeding efforts proved successful. These trials were part of the soil and moisture conservation program. Other trial range study plots were established in the 1950's by the land management agencies. The BLM in conjunction with the Soil Conservation Service, initiated range trials to improve forage and habitat for both wildlife and livestock through selection of improved seed. Fire rehabilitation and erosion control were driving forces behind experiments to improve successful establishment. Grazing associations were encouraged by federal agencies to sow grass seed and, in some instances, given seed for that purpose. BLM partnered with the Oregon Game Commission in 1960 through the 1970's in several efforts to improve deer winter range throughout the Agate Flat area by scarification, seeding, water development and aerial fertilizations. Broadcast seeding, disking and rangeland drills were used to achieve maximum success from the rehabilitation efforts.

Appendix C lists the non-native plants with known presence on the Jenny Creek LSR. These are primarily based upon Soil Vegetation Inventory Method (SVIM) surveys conducted on public lands in the early 1980s and continuing rangeland monitoring studies.

Noxious Weeds

Among the alien plants in the Jenny Creek LSR are a few species of particular interest because of the intensity of their impact on human welfare and the natural environment. These plants have been designated as Noxious Weeds by the Oregon State Weed Board. Noxious weeds are defined by the Weed Board as "[those plants] which are injurious to public health, agriculture, recreation, wildlife, or any public or private property." Noxious weeds have been declared a menace to public welfare (ORS 570.505) (Oregon Department of Agriculture 1995).

Two statutory mandates guide the BLM in managing weeds on public lands. Section 302(b) of the Federal Land Policy and Management Act of 1976 directs the BLM to "take any action necessary to prevent unnecessary or undue degradation of the lands" (43USC 1732(b)). Section 2(b)(2) of the public Rangelands Improvement Act of 1978 adds that the BLM will "manage, maintain, and improve the condition of the public rangelands so that they become as productive as feasible..." (43 USC 1901(b)(2)).

See Map 2-8 and Appendix D for noxious weeds known to occur on or can be expected to invade the Jenny Creek LSR. It is primarily based on the 1996-1998 Medford District noxious weed surveys.

WILDLIFE SPECIAL STATUS SPECIES

Special Status Species

Special Status Species (SSS) include those species that are listed as threatened or endangered, are proposed for listing as threatened or endangered, or are a candidate for listing as threatened or endangered by the U.S. Fish and Wildlife Service, under the auspices of the Endangered Species Act

(ESA) of 1973, as amended. Also included are those species listed by the BLM as sensitive and assessment species. For this LSR assessment, those species identified in the *Final Supplemental Environmental Impact Statement on Management of Habitat for LSOG and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl (SEIS) Record of Decision (ROD)* for protection by Protection Buffers and Survey and Manage strategies will also be addressed as SSS. By definition, these species are in a "red flag" category. Inventory and monitoring is needed to better assess habitat needs and population status of many of these species; particularly those that are not presently listed under the auspices of the ESA. Special management may be necessary to ensure long-term population viability. Any management projects in the LSR would be subject to the same requirements to survey for SSS as apply to projects in the Matrix. See Appendix E for special status species not associated with LSOG habitat.

LSOG Reserve Fauna: General Description

The fauna of the Jenny Creek LSR is quite diverse. In addition to the unique fish in Jenny Creek, the stream and its tributaries are home to several unique mollusks and the basin hosts a wide variety of reptiles uncommon within the Cascade Mountains. Common and California mountain kingsnakes, the southern alligator lizard, and the western rattlesnake are found here. Several birds that are not widespread in western Oregon, such as the acorn woodpecker and plain titmouse, are well established here. The Basin also supports a large black-tailed deer herd and a growing elk herd. The area is a mix of "Eastside" and "Westside" habitat types. This mix of habitat types results in an unusual species assemblage, or suite of species. Rough skinned newts, NSOs, and kangaroo rats are present in parts of this LSR. Maintaining this great biodiversity is one of the greatest challenges confronting the Bureau of Land Management in southwestern Oregon.

Some species found here, such as the meadowlark and bluebird, depend on open, grassy habitat types, while other species require closed canopy forest. The LSR designation directs that the designated lands that are capable of supporting LSOG habitat be managed to produce and maintain LSOG habitat. This has implications for open/early seral habitat associated species.

Terrestrial Wildlife

There are 235 terrestrial vertebrate wildlife species are known or suspected to inhabit in the Jenny Creek LSR (Jenny Creek Watershed Assessment and Analysis, Appendix 10, 1995). This species richness reflects the diversity of habitats found in the LSR. Twenty eight of these vertebrate species are considered "special status species" and will be discussed further. There are also six species of terrestrial invertebrate wildlife (all mollusks) with special status known or suspected to occur in the LSR. These species will also be discussed below.

Birds

Northern Spotted Owl (*Strix occidentalis caurina*)

The NSO is listed as a threatened species under the auspices of the ESA. NSOs are generally associated with LSOG coniferous forests, which are characterized by large trees, multi-layered canopies, and a high degree of canopy closure. As discussed earlier in the assessment document, it is largely due to concerns about the long-term viability of the NSO that the LSR land allocation was created in the ROD.

The ROD also directed that 100 acres of the best NSO habitat will be retained as close to the nest site or owl activity center as possible for all known (as of January 1, 1994) spotted owl activity centers located on federal lands in the matrix land allocation. "Activity center" is defined as an area of concentrated activity of either a pair of spotted owls or a territorial single owl. Activities within the 100-acre area should comply with management guidelines for the LSRs. Management around this area will be designed to reduce risks of natural disturbance. Because these areas are considered important to meeting objectives for species other than spotted owls, these areas are to be maintained even if they become no longer occupied by NSOs.

The same ecoregion specific standards, targets and objectives that drive the silvicultural prescriptions within the Jenny Creek LSR (Chapter 4) apply to these seven NSO Activity Centers that fall within 10 miles of the Jenny Creek LSR and within the four ecoregions discussed in the LSRA. These sites are described in Table 2-18.

NSO Designated Critical Habitat

There are 21,664 acres of NSO Critical Habitat Unit (CHU) OR-38 in the Jenny Creek LSR. The USFWS designated CHUs on federal lands throughout the range of the NSO after the species was listed as threatened. The specific purpose of the CHU was to provide essential nesting, roosting, foraging, and dispersal habitat for the species to ensure its long term viability. The specific purpose of CHU OR-38 was to provide linkage between the Oregon Cascades and Klamath Provinces through the I-5 Area (Corridor) of Concern. The Jenny Creek LSR lies on the eastern flank of the I-5 Area of Concern. Table 2-19 displays acres common to CHU #OR-38 and the LSR.

Table 2-18. NSO Activity Centers outside the Jenny Creek LSR boundary but covered by the Jenny Creek LSR Assessment

Site No.	Ecoregion	Legal Description	Distance and Direction from Jenny Creek LSR
3278	South Cascade Slopes *	T.39S. R.4E. S.23	0.5 mile, East
4061	Klamath River Ridges	T.40S. R.3E. S.5	2 miles, South
0930	Klamath River Ridges	T.41S. R.2E. S.1	1 mile, South
2399	South cascades **	T.39S. R.2E. S.13	3.5 miles, West
2268	South Cascades	T.39S. R.4E. S.3	0.5 mile, North
0040	South Cascades	T.38S. R.4E. S.27	2.5 miles, South
2261	South Cascades	T.38S. R.4E. S.32	2.0 miles, South

* Borderline between South Cascades and South Cascade Slopes.

** Borderline between South Cascades and Siskiyou Foothills.

NSO Reproduction and Habitat at Known Sites

Prior to the development of the Northwest Forest Plan there were several attempts to develop conservation plans for the NSO and other LSO associated species. These plans were aimed at providing a conservation strategy that would ensure the viability of the NSO. A common feature of all of these plans was a system of reserves along the Cascades. Different plans had different boundaries for the reserves, but they all showed a reserve in the general area of the Jenny Creek LSR. At one point, there was a stated conservation goal of 17 to 20 reproducing pairs of NSOs in the area that is now the Jenny Creek LSR. The long term goal for the Jenny Creek LSR is to protect and maintain the current 17-pair populations level. A goal of 20 reproducing pairs of NSOs may be feasible but appears optimistic over the long term.

The NFP established LSRs based previous work on NSO and a conceptual framework of "Clusters and Connectivity". The basic idea was to have a "cluster" of breeding pairs of NSOs in each of the large LSRs, and to ensure connectivity between the LSRs throughout the lands designated as Matrix and Riparian Reserves. The Jenny Creek LSR has 17 known NSO pair sites as defined by the Interagency Spotted Owl Protocol. In the two mile thick "doughnut" surrounding the LSR, there are an additional 5 more sites, each with its own 100-acre activity center. The sites in the Jenny Creek LSR and the "doughnut" have been monitored fairly intensively since 1990. Some of the sites have been monitored more intensively than others, and some for much longer. Table 2-20 summarizes the known reproductive history of the sites in the LSR and "doughnut" as well as the habitat conditions within the provincial home range radius (1.2 miles) of each site.

Table 2-19. NSO designated critical habitat within Jenny Creek LSR

NSO Habitat Type	Designated Habitat (Acres)	Percent	NSOs pairs if home range has 40% suitable habitat (1,182 acres)*
Habitat Types 1 and 2 (NRF)	7,499	34.6%	6.3
Habitat Types 3 and 5 (potential)	8,869	40.9%	7.5
Habitat Types 4 and 6 (Dispersal or no potential)	5,296	24.4%	
Total	21,664	100.0%	14.2

* See medium provincial home range radius and minimum suitable home-range acreage discussion below.

The known NSO sites within the Jenny Creek LSR vary considerably in the amount of suitable habitat within the median provincial home range radius [1.2 miles (2,955 acres) for NSOs in the Oregon Cascade Province]. Table 2-20 shows the acreage of suitable habitat within the median provincial home range for each site within the LSR and those sites within 2 miles of the LSR. As a rather gross estimate of the adequacy of suitable habitat in these sites, the acreage values can be compared to 1,182 acres (40 percent of the area covered by 1.2 mile radius circle). This is the threshold for incidental take established by the U.S. Fish and Wildlife Service. If the site is at or below this threshold, any further loss or degradation of suitable habitat within the home range circle can be expected to have a high likelihood of altering the behavior and activities of the NSO occupying the site. The altered activities may include foraging and breeding behavior and dispersal of any young produced.

Table 2-20 indicates that not all of the sites in the LSR are contributing to recruitment into the NSO population on a regular basis. In fact, BLM never observed more than 11 pairs of NSOs in the LSR in any given breeding season. This means that the LSR is not currently functioning at the desired level with regard to NSO population support.

There are three ways to increase NSO productivity of the LSR:

- Increase the quality of existing suitable habitat.
- Increase the amount of suitable habitat.
- Rearrange the same amount of suitable habitat on the landscape so that it becomes more useful to the NSOs.

Of these strategies, it is likely only protecting and increasing the amount of suitable habitat is feasible at this time. This strategy calls for protecting all potential habitat and enhancing Habitat Types 3

Table 2-20. Summary of reproduction and habitat availability of NSO sites within and adjacent to the Jenny Creek LSR (1.2 mile radius = approximately 2,955 acres)

Site #	NSO Reproduction: Fledglings with Pair (#), Nesting (N), Pair (P), or Single (S)								Habitat Availability Current Acreage			Percentage Current NRF of Home Range (2,995 Ac)
	1990	'91	'92	'93	'94	'95	'96	'97	NRF	Potential	Not Capable	
0977	2	2	1	P	2	S	P	1	176	344	2,435	6%
2285	S	P	N	P	N	P	P	P	194	344	2,417	6%
2404	S	1	1	P	1	S	N	P	358	283	2,314	12%
3272	00	00	2	N	2	1	1	S	207	831	1,917	7%
2270	1	1	00	S	00	P	N	P	405	133	2,417	14%
0061	2	P	1	N	N	N	S	P	803	457	1,695	27%
2078	2	2	1	P	P	P	N	1	464	907	1,584	16%
1305	P	S	2	P	2	P	P	S	1012	443	1,500	34%
2020	00	P	S	S	S	S	NS	00	600	593	1,762	20%
0092	00	S	S	P	3	P	3	00	120	1390	1,445	4%
0891	N	P	P	P	1	P	1	P	750	8	2,197	28%
3273	NS	NS	N	N	2	P	N	1	674	78	2,203	23%
0966	00	S	P	P	NS	00	00	00	805	285	1,865	27%
4043	00	00	P	P	P	P	2	2	830	614	1,511	28%
0962	P	2	2	P	2	S	2	S	698	174	2,781	24%
4063	00	00	00	P	2	P	N	P	972	197	1,786	33%
3274	00	00	P	S	00	00	00	00	401	55	2,499	13%
3278	NS	S	1	P	1	00	00	00	536	417	2,002	18%
2268	P	P	S	S	00	S	2	P	396	657	1,902	13%
2261	2	S	2	P	2	2	1	P	658	826	1,471	22%
0930	S	P	1	P	2	1	P	S	520	372	2,063	18%
4061	NS	NS	NS	P	S	NS	NS	NS	589	23	2,343	20%

Site is not in LSR but in 2-mile "doughnut" around LSR.

S: Single bird present;

1: Nesting pair present, 1 fledgling observed.

2: Nesting pair present, 2 fledglings observed.

3: Nesting pair present, 3 fledglings observed.

Potential Acres: BLM acreage not currently NRF habitat, but has the potential to develop into NRF.

Not Capable: Lands not capable of providing NRF habitat.

N: Nesting pair present, no fledglings observed.

P: Pair present

00: Surveys performed, no birds detected.

NS: Site was not surveyed this year.

NRF: nesting, roosting, foraging (suitable)

and 5. The current habitat conditions and minimum home range thresholds indicate losses or degradation of suitable (NRF) habitat within NSO home ranges is a critical issue in the short-term.

NSO Dispersal and Habitat Connectivity

Since the late 1980s, almost all of the adult NSOs on the Ashland Resource Area have been captured and individually marked with a plastic band of a site-specific color and/or pattern. These birds are also marked with unique numbered USFWS aluminum bands. Most of the juvenile NSOs produced have also been captured and marked with a standard color "juvenile band" and a USFWS band. Until 1990, there was not an effort to catch and band every spotted NSO at every site. Since 1990, this "band-'em-all" policy was in effect until approximately 1995 across the resource area and has largely been applied to the LSR to date. This has allowed us to track movements of individual adults and juvenile NSOs. Appendix F lists the documented movements of NSOs into, out of, and within the LSR. Table 2-21 notes the distance and direction of nearest adjacent LSRs.

It is clear that the LSR NSO population is not isolated from NSOs in the Matrix. It is also clear that there is genetic exchange with populations to the north, east and west which is facilitated by the Jenny Creek LSR. In one notable case, a bird banded as a fledgling near Ruch, Oregon was recaptured in the LSR as a breeding adult. This bird moved 35 miles into the LSR. The route this individual took is unknown. There is no documented movement in either direction (east/west) across the I-5 corridor near the Siskiyou Pass/ Pilot Rock area.

This apparent lack of movement across the Soda Mountain/Pilot Rock/Mount Ashland ridge line is of some concern because this area is one of the few places where there is relatively intact habitat linking the populations in Klamath and Cascade mountains. If the exchange of genetic material, in the long term, does not occur in this vicinity, the probability of it occurring at all is low.

During the mid 1980's through the mid 1990's, there was a NSO demographic study in the Ashland Watershed/Mount Ashland area. This study conducted by USFS and Oregon State University (OSU) included capturing and banding NSOs. No movement between the study area and the LSR was documented.

There is no documented movement to or from the LSRs in northern California. This lack of evidence of movement could be due to the fact that the Klamath and Rogue River National Forests have not been banding and recapturing NSOs as a regular program, although both forests have done some limited banding as part of research projects.

Fruit Growers Corporation (Hilt, California) is a major land owner in the northern part of Siskiyou County California and has been banding NSOs on their lands for several years. There have been no reports of Ashland Resource Area NSOs turning up on Fruit Growers land or vice versa.

Bald Eagle (*Haliaeetus leucocephalus*)

Bald eagles nest on Hyatt Lake. No known nests occur in the LSR. Surveys for new nests and reproductive success at known nests occur annually. This species is currently listed as threatened under the Endangered Species Act (ESA).

Table 2-21. Distance and direction to nearest LSRs from Jenny Creek LSR

Direction	Center to Center Distance (miles)	Edge to Edge Distance (miles)	Majority Ownership of Intervening Lands
N	18	5	Federal Matrix and Private Industrial Timberlands
SE	21	6	Private, Unknown Type/Use
W	12	5	Federal Withdrawn/Reserved and Private mixed Type/ Use
E	None	None	NA.

NFP Protection Buffer Species

Pygmy Nuthatch (Sitta pymaea)

The pygmy nuthatch was identified in the SEIS ROD as a species to receive protection buffers where nest/roost sites are found. Primary habitat is mature/old-growth conifer forest with a component of pine in the Mixed Conifer and White Fir Zones. An open canopy is preferred. Roost sites, which may shelter over 100 individuals, are very important for winter survival. Little is known about this species in the LSR. There are no known roost sites in the LSR. There has been no inventory of this species in the LSR. It is unclear what, if any, effect management for the development of LSOG habitat would have on this species.

Great Gray Owl (Strix nebulosa)

The great gray owl is a Bureau-sensitive species that also receives protection buffers under the SEIS ROD. Great gray owls nest in mature/late seral Mixed Conifer and White Fir Forests, and forage primarily in the meadows/grassland or early seral stand conditions of conifer forests. There is one known great gray owl nest site in the LSR. Since 1992 there have been some opportunistic inventories for great gray owls, but no widespread systematic inventory in the LSR. However, incidental sightings have been reported over the years. It is highly likely that there are as yet undiscovered nests in the LSR. Population trend in the LSR is unknown, but based on the number of reported sightings and the results of surveys adjacent to the LSR, the population in the southern Cascades appears to be stable.

This species could potentially be impacted by management activities aimed at producing and maintaining LSOG habitat on the LSR lands unless appropriate protection measures were implemented. If these measures are adhered to in the short term, the development of LSOG habitat in the long term may benefit this species.

The NFP has specific mitigation measures for great gray owl: provide a no-harvest buffer of 300 feet around meadows and natural openings and establish a 1/4 mile protection zone around known nest sites (C-21). Enhancement and hazard reduction treatments and any proposed meadow restoration or manipulation or brushfield treatments in the vicinity of known nests and meadows or natural opening would have to take the needs of this species and the prescribed protection measures into consideration.

Bureau Sensitive Species

Northern Goshawk (Accipiter gentilis)

The northern goshawk is a Bureau sensitive species. In the LSR, this species appears to be a foraging habitat generalist and a nesting habitat specialist. Preferred nesting habitat for northern goshawks in this part of their range is in LSOG Mixed Conifer and White Fir Forest habitat. Nests are built in crotches of forked trees, at the base of large limbs, or at the "barber chair" of a blown out top that has been replaced by an upward curving side branch that has assumed apical dominance. Nest trees are usually among the largest diameter trees in the stand. There are three known nest sites within the Jenny Creek LSR. There has not been any systematic inventory for goshawks within the LSR. However, numerous incidental sightings documented over the years make it likely that there are as yet undiscovered nests in the LSR.

This species could potentially be impacted by management activities aimed at producing and maintaining LSOG habitat on the LSR lands unless appropriate protection measures were implemented. If these measures are adhered to in the short term, the development of LSOG habitat in the long term may benefit this species.

Bureau Assessment Species

White-headed Woodpecker (Dendrocopos albolarvatus)

The white-headed woodpecker is a Bureau assessment species. The SEIS ROD directs that this species be given extra protection where it occurs by retaining more snags in harvest units. In our area, primary habitat is found in the White Fir and Mixed Conifer Forests where pines are a component of the conifer stands. This species nests in cavities it creates in relatively large pine snags. Little is known about this species within the LSR. However, based on field observations, the population is probably quite small. There are only occasional reported sightings of white-headed woodpeckers in the LSR.

This species could potentially be impacted by management activities aimed at producing and maintaining LSOG habitat on the LSR lands unless appropriate protection measures were

implemented. If these measures are adhered to in the short term, the development of LSOG habitat in the long term may benefit this species.

Black-backed Woodpecker (Picoides arcticus)

The black-backed woodpecker is a Bureau assessment species. It is also a species that is to receive extra protection under the SEIS ROD by retention of additional snags in harvest units. Little is known about this species in the LSR. In our area, primary habitat is found in the White Fir zones.

This species could potentially be impacted by management activities aimed at producing and maintaining LSOG habitat on the LSR lands unless appropriate protection measures were implemented. If these measures are adhered to in the short term, the development of LSOG habitat in the long term may benefit this species.

Northern Three-toed Woodpecker (Picoides tridactylus)

The northern three-toed woodpecker is a Bureau assessment species. Little is known about this species in the LSR. Primary habitat is found in the White Fir Forests.

This species could potentially be impacted by management activities aimed at producing and maintaining LSOG habitat on the LSR lands unless appropriate protection measures were implemented. If these measures are adhered to in the short term, the development of LSOG habitat in the long term may benefit this species.

Pileated Woodpecker (Dryocopus pileatus)

The pileated woodpecker is a Bureau assessment species that is found throughout the LSR. Primary habitat is mature/old-growth coniferous forest in the Mixed Conifer and White Fir zones. It is also found in lower elevation woodlands, but in fewer numbers than in the other zones, and only if conifers or hardwoods of sufficient size for the creation of nest and roost cavities are present. Nothing is known about actual population trend for this species in the LSR. Populations are likely declining due to harvesting of the mature/old-growth coniferous forest.

This species could potentially be impacted by management activities aimed at producing and maintaining LSOG habitat on the LSR lands unless appropriate protection measures were implemented. If these measures are adhered to in the short term, the development of LSOG habitat in the long term may benefit this species.

Flammulated Owl (Otus flammeolus)

The flammulated owl is a Bureau assessment species that is found throughout the LSR. This species is designated by the SEIS ROD to receive extra protection by retention of additional snags in harvest units. Primary habitat is conifer forest intermixed with oak-woodland and grassland in the Mixed Conifer Zone. Population trend in the LSR is unknown. Most detections of this species have been made during inventories for NSOs. This species nests in cavities created by other birds species in large pine trees and snags. Consequently, this species could potentially be impacted by management activities aimed at producing and maintaining LSOG habitat on the LSR lands unless appropriate

protection measures were implemented. If these measures are adhered to in the short term, the development of LSOG habitat in the long term may benefit this species.

Golden Eagle (Aquila chrysaetos)

While the golden eagle is not listed under the ESA and is not a Bureau Sensitive species, it is protected under the auspices of the Bald and Golden Eagle Protection Act of 1940. There are no known nests in the LSR. There have been numerous sightings in the Jenny Creek and Emigrant Creek drainages, and it is likely that there are undiscovered nests in the LSR. Although this species is not considered a LSOG associate over its entire range, it is associated with LSOG habitat in this area. This species builds large nests in dominant overstory trees. The nest trees often have significant defect, such as a blown out top or large branches, and are usually one of the largest diameter trees in the stand. Known nest sites are located outside of the LSR.

Terrestrial Mammals

Bureau Assessment Species

Fisher (Martes pennanti)

The fisher is a Bureau assessment species. Preferred habitat is dense conifer forests in the Mixed Conifer and White Fir zones. There are no recent records of fisher in the LSR. Populations were quite high in the upper portions of the Jenny Creek watershed at the turn of the century, but intensive trapping caused a decline in the population (Minore 1978). There is no explanation why fisher have not recovered with the decrease in trapping pressure, but it is speculated that habitat loss due to intensive timber harvest and associated road building has kept the population depressed.

This species could potentially be impacted by management activities aimed at producing and maintaining LSOG habitat on the LSR lands unless appropriate protection measures were implemented. If protection measures are adhered to in the short term, the long-term development of LSOG habitat in Riparian Reserves may benefit this species. There are no specific protection measures prescribed for this species and it is unknown what steps are necessary to protect the species and its habitat other than retention/protection of potential dens, which are hollow logs and trees, large cavities in trees and snags, and large horizontal brooms.

Track counts were conducted in portions of the LSR in the winters of 1992-93 and 1993-94.

American Marten (Martes americana)

The marten is a Bureau assessment species. Preferred habitat is mature/old-growth conifer forests that have an abundance of large down woody material and standing snags in the Mixed Conifer and White Fir zones. Tracks of marten have been found in the Jenny Creek watershed in the Howard Prairie and Johnson Creek areas adjacent to LSR lands, consequently, it is highly likely that marten occur in the LSR. Very little is known about the present distribution and abundance of this species in the LSR. Historically, the population is believed to have been quite high, but intense trapping caused a decline. As with the fisher, it is speculated that habitat loss due to intensive timber harvest and associated road building has kept populations depressed.

This species could potentially be impacted by management activities aimed at producing and maintaining LSOG habitat on the LSR lands unless appropriate protection measures were implemented. If protection measures are adhered to in the short term, the development of LSOG habitat in Riparian Reserves in the long term may benefit this species. There are no specific protection measures prescribed for this species and the steps necessary to protect the species and its habitat are not known other than retention/protection of potential dens, which are hollow logs and trees, large cavities in trees and snags, and large horizontal brooms.

Pacific Pallid Bat (Antrozous pallidus)

The Pacific pallid bat is a Bureau assessment species and is a Survey and Manage strategy 1 & 2 species in the ROD. Preferred habitat is canyons and other rocky areas near water sources in arid areas. There are records of this species in the LSR, however, little is known of its distribution and abundance. This species is not likely to be impacted by management activities aimed at producing and maintaining LSOG habitat on the LSR lands.

NFP Survey and Manage Species***Red Tree vole (Arborimus longicaudus)***

This species is listed as a Survey and Manage strategy 2 species in the NFP. No surveys have been conducted in the LSR, and the LSR is outside the known range of the species. Some surveys have been conducted between the LSR and the eastern edge of the known species range with negative results. This arboreal vole is closely associated with Douglas-fir, the needles of which it consumes and uses to make nests.

If present, this species could potentially be impacted by management activities aimed at producing and maintaining LSOG habitat on the LSR lands unless appropriate protection measures were implemented. If protection measures are adhered to in the short term, the development of LSOG habitat in the long term may benefit this species. There are only general suggestions regarding protection measures for this species at this time.

Terrestrial Mollusks

There are six species of terrestrial mollusks (slugs and land snails) with special status that are known or suspected to occur in the LSR (Table 2-22). These species are listed under Survey and Manage strategy 1 and 2 in the NFP. There have been limited surveys by researchers in the LSR.

If present, these species could potentially be impacted by management activities aimed at producing and maintaining LSOG habitat on the LSR lands, unless appropriate protection measures are implemented. If protection measures are adhered to in the short term, the development of LSOG habitat in the long term may benefit these species. There are only general suggestions regarding protection measures for these species at this time.

Table 2-22. Special Status terrestrial mollusks in the Jenny Creek LSR

Species	Status	Presence
<i>Helminthoglypta hertleini</i> (land snail)	S&M 1 and 2	Suspected
<i>Megomphix hemphilli</i> (land snail)	S&M 1 and 2	Suspected
<i>Monadenia Chaceana</i> (land snail)	S&M 1 and 2	Probable
<i>Trilobopsis tehemana</i> (land snail)	S&M 1 and 2	Suspected
<i>Prophysian dubium</i> (slug)	S&M 1 and 2	Suspected
<i>Prophysian coeruleum</i> (slug)	S&M 1 and 2	Yes

Special Emphasis Species

Black-tailed deer (*Odocoileus hemionus*) and Roosevelt elk (*Cervus elaphus*) are considered special emphasis species for this LSR assessment. These species are not old-growth/LSOG habitat associated; they are dependant on early successional stages for forage. Management of the LSR with an emphasis on creating/maintaining LSOG habitat will effect these species. They have been given special attention in the assessment because of their recreational value for both hunting and viewing, even though they do not depend on LSOG habitat. See Map 2-9 for location of Big Game Management Areas.

Black-tailed Deer (*Odocoileus hemionus*)

Black-tailed deer are quite numerous throughout the LSR. Trend counts conducted by Oregon Department of Fish and Wildlife (ODFW) indicate a relatively stable population. Historically, there have been some decreases in the population due to die-offs during extreme winter weather, but the population has recovered from these decreases. In recent years, surveys have revealed very low buck/doe ratios. This finding indicates heavy hunting pressure and/or poor escapement of legal bucks. High road density and large expanses of land without adequate hiding cover are suspected of contributing to poor buck survival through the hunting season.

Most of the deer in the LSR are essentially migratory. Generally, they winter in the lower elevation woodlands and summer in the Mixed Conifer and White Fir Forests and openings at higher elevations. Habitat condition on both the winter and summer range is judged to be fair. On summer range, forage condition appears to be adequate currently but there is a concern that managing the LSR for LSO conditions will limit forage availability, at least on public lands. The ODFW is concerned about the current adequacy of summer thermal cover due to intensive timber harvest (both recent and historic) in the area on both private and public lands. Forage condition on deer winter range is deteriorating due to the encroachment of exotic grasses and forbs, the exclusion of fire from the mountain chaparral vegetative community, and overgrazing, particularly on private land. Yellow starthistle, medusahead rye, and cheatgrass are some of the more common introduced species that are displacing native grasses and forbs. Compared to native species, these exotics are poor producers of forage for deer. The exclusion of fire has allowed browse species favored by deer to become decadent and of little forage value. Under natural conditions, this shrub is regenerated by fire. Due to intensive fire suppression efforts, the fire return interval on winter range is longer and regeneration of wedgeleaf has lagged. Existing plants have become old and decadent and forage quality and quantity have decreased dramatically. The objective of several controlled burns in the watershed has been to regenerate wedgeleaf ceanothus.

Overgrazing has a two-fold effect on forage conditions. First, cattle consume forage that would otherwise be available for deer, and secondly, continual overgrazing reduces the vigor of native species and they are eventually displaced by exotic species.

Winter thermal cover generally has the following attributes: conifer stands composed of trees greater than approximately 30 feet in height, canopy closure 70 percent or greater, and the stands are greater than 0.50 acre. Due to natural conditions existing at lower elevations, there is not much thermal cover present on the winter range. Regardless, it aids deer in energy conservation by retarding heat loss and can make the difference in survival in extreme weather. Thermal cover condition on winter range has been degraded primarily by timber harvest.

Vehicular disturbance has been identified as a major contributing factor causing stress to deer on the winter range. When deer are disturbed, their metabolic rate increases and energy reserves are depleted unnecessarily. Open road density greater than 1.5 miles per square mile is generally accepted as a threshold beyond which vehicular disturbance has the potential to become a major factor in energy loss. Open road density on deer winter range is approximately 2.5 miles per square mile.

Roosevelt Elk (Cervus elaphus)

Roosevelt elk are present throughout the LSR in varying numbers. There are substantial herds found in the Chinquapin Mountain and Keene Creek Ridge areas. In the rest of the LSR, they tend to be present in scattered smaller herds. ODFW trend counts for the Rogue Big Game Management Unit indicate an increasing population of elk. The counts are not specific to the LSR, but the population trend in the LSR should not differ from the management unit as a whole. Habitat condition for elk is judged to be good, and this is reflected in increasing populations. Due to an increasing elk population

on deer winter range, there is concern about potential competition for the somewhat limited available forage.

The elk management area in the Jenny Creek watershed was established to emphasize elk management. The elk management area encompasses 15,300 acres of the Jenny Creek watershed and overlays deer winter range. Part of the LSR overlays the elk management area particularly the Klamath River Ridges and the South Cascade Slopes Ecoregions. A combination of improved habitat conditions, especially forage conditions, and a regulated elk population would minimize the competition between elk and wintering deer.

Other Wildlife Species

There are many other wildlife species known or suspected to be present in the LSR (Jenny Creek Watershed Assessment and Analysis, Appendix 10, 1995). A basic assumption of the Northwest Forest Plan is that the viability of these species will be ensured if the fundamental goals of ecosystem management are met. The public lands can be expected to provide increasing amounts of habitat for mid- and LSOG species, while intermingled private lands provide early and mid-seral habitat as they continue to be managed on a relatively short rotation.

Aquatic Species

(Group includes mollusks, crustaceans, insects, and fish)

Jenny Creek LSR consists of parts of three main watersheds, western Jenny Creek, upper Bear Creek (Emigrant/Tyler Creeks), and the upper headwaters of Dutch Oven and Camp Creek. The LSR also has Hyatt Reservoir, with two developed campgrounds, and Parsnip Lakes, a series of slump lakes, beaver ponds and marshes, associated with Keene Creek within the Jenny Creek Key Tier 1 Watershed (see Map 1-7). Streams associated with the Jenny Creek LSR have been surveyed for important aquatic animals. Groups include mollusks, crustaceans, insects, and fishes.

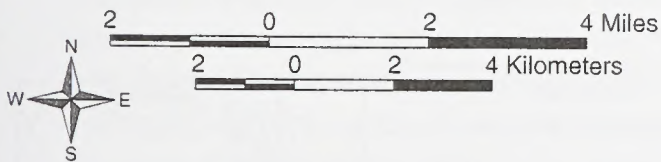
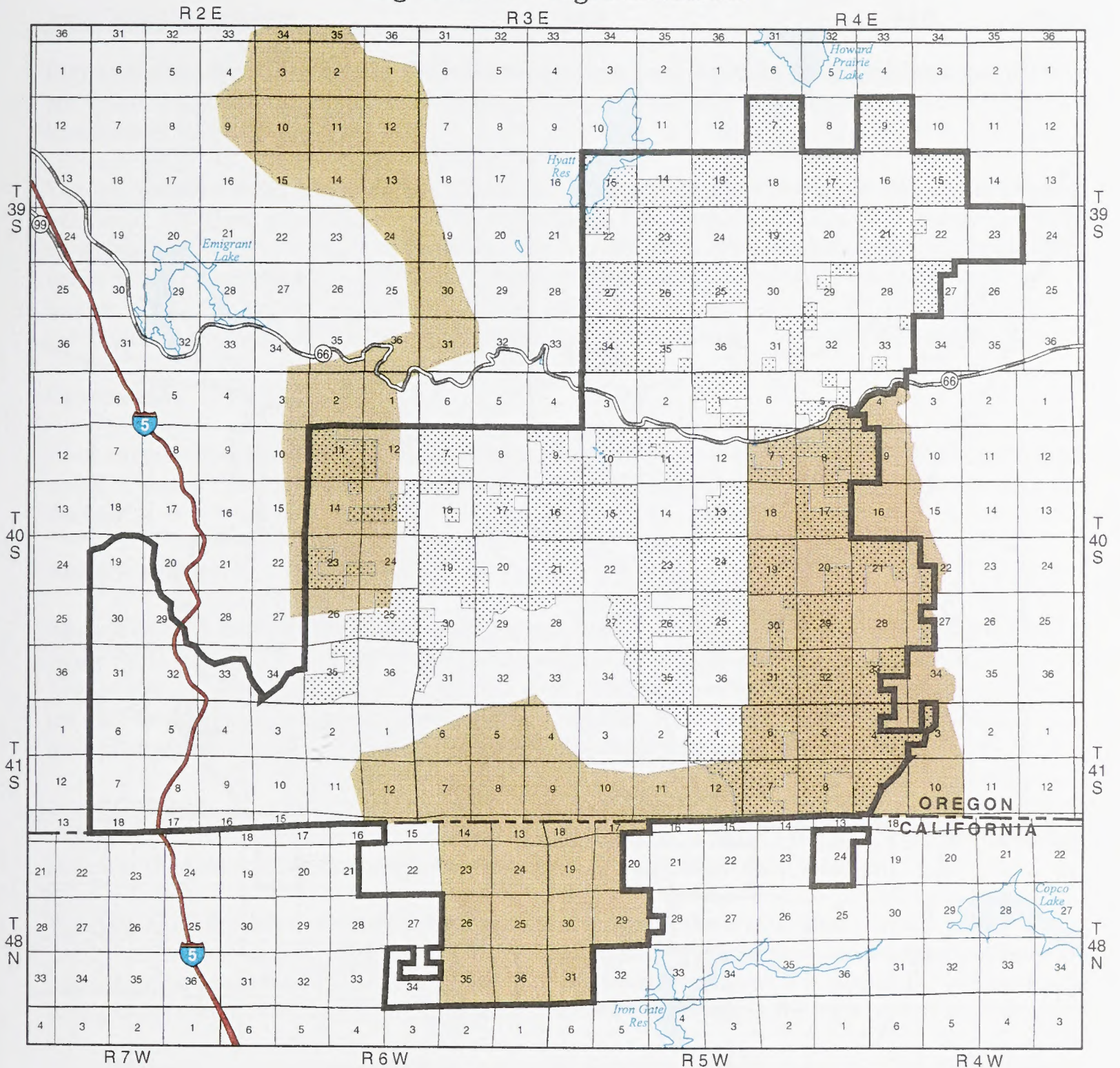
The aquatic organisms and their habitat in the streams have been the subject of on-going studies because of interest in riparian habitat and the streams' unusual fish populations.

Mollusks

Mollusks are of particular interest because of the role they play in the food chain and the presence of endemic species. Several snail and fresh water mussels genera inhabit LSR streams and tributaries.

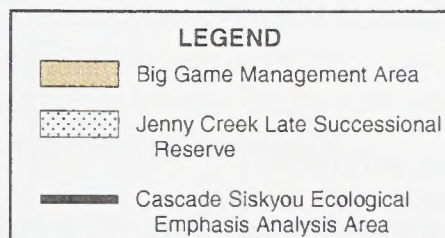
The most common Jenny Creek snail is *Ajuga silicula*. *Physella* is also present. These snails play an important role in the Jenny Creek food chain as competing algal grazers and as food for other animals like spotted sandpipers (Parker pers. com. 1998).

Jenny Creek Late Successional Reserve Big Game Management Areas



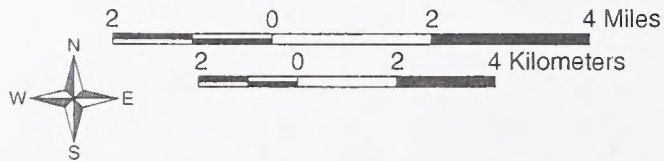
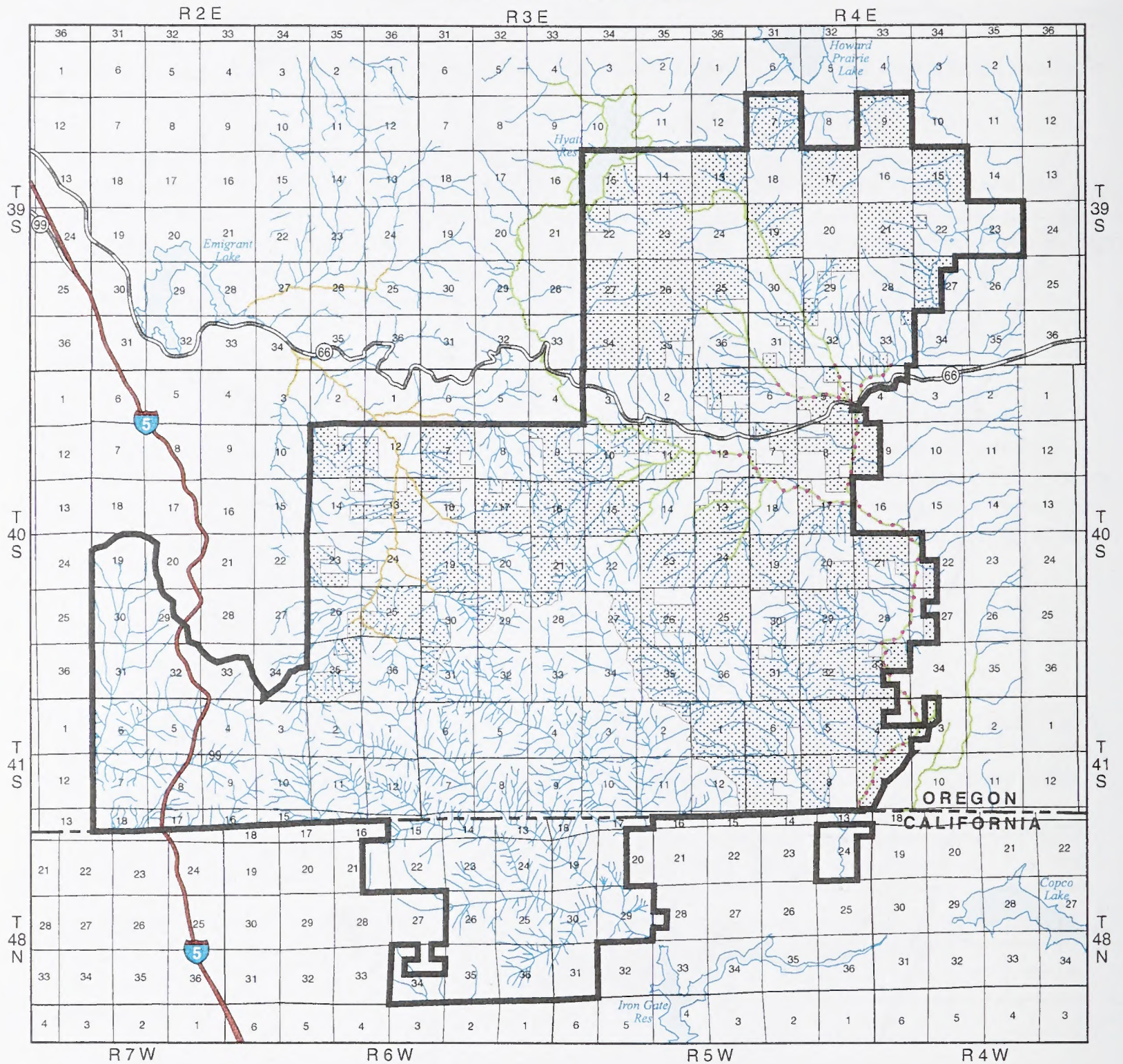
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Bureau of Land Management
Medford District
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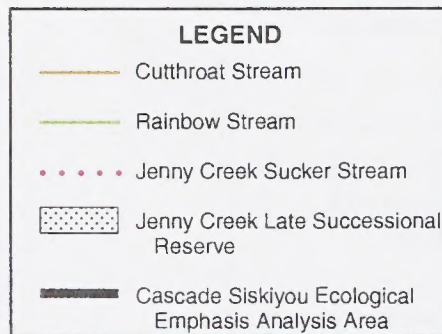
MAP 2-9

Jenny Creek Late Successional Reserve Fish Stream Locations



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MAP 2-10

D03-02-00:JR

Eight proposed species of Pebblesnails (*Fluminicola* ssp) and the scalloped juga (*Ajuga acutifilosa*) are found in cold springs in the Jenny Creek Drainage. These rare endemics add to the rich level of biodiversity associated with the LSR.

The fresh water mussel *Margaritifera falcata* and fingernail clams in the family Sphaeriidae (Parker pers. com. 1998) are present in Jenny Creek drainage. The Jenny Creek form of *M. falcata* might be an undescribed variety because of its smaller size. Fresh water mussels move about by parasitizing fishes with an early developmental stage. The fish the mussel uses for upstream migration is not known. The other streams in the LSR have not been surveyed for mollusks, although Wisseman (1993) found unidentified snails in the Hydrobiidea in Dutch Oven Creek that might be endemic.

Crustaceans

What might be the Klamath Crawfish, *Pacifastacus leniusculus klamathensis*, is common throughout much of Jenny Creek. There is no information available for crustaceans from the other streams in the LSR.

Aquatic Insects

Aquatic invertebrate surveys have been conducted at four locations in Jenny Creek, and one each in Jenny Springs, Soda, Keene and Dutch Oven creeks over an eight year period (Wisseman 1991, 1992, 1993, 1994 and 1995) as a part of the BLM's overall aquatic monitoring program. Aquatic insects are excellent indicators of stream health, because specific insects are tolerant or intolerant of particular stream conditions, such as fine sediments, warm water, and woody debris.

Jenny Creek has an array of aquatic insects. Sampling done in 1991 found 36 taxa in the watershed. Tricoptera (Order) represented 53 percent of the collection. Plecoptera (Order), a group that often serves as indicators of stream health, comprised only five percent of the samples.

Analysis of all the surveys shows a definite pattern that indicates a connection between stream conditions and the aquatic insect community. In lower Jenny Creek, five insect species made up 70 percent of the population (Wisseman 1995). These five species are all tolerant of fine sediments and warm water which indicate a high fine sediment level on rocks and in the water column.

Macroinvertebrate sampling at the north and south ends of the Box O Ranch in 1995 found most of the fauna were wide spread, common North American species associated with mid-order streams. The Jenny Creek samples had a mixture of montane and basin species. Sensitive, threatened and endangered, rare, or small-stream associated species were not collected. Long-lived taxa (dragonfly larvae and other invertebrates like snails) tolerate warm water. High summer water temperatures in Jenny Creek are lethal to cold water invertebrates and most salmonids.

Jenny Creek is a rare atypical xeric plateau stream with few comparable streams on the Medford District. Although the natural setting contributes to conditions in Jenny Creek, they are exacerbated

by logging, roads, and a long history of grazing. Compared to other mid-order, forested montane streams Jenny Creek is substantially warmer in the summer, is wide and shallow in most reaches, has low overall habitat complexity, limited shading in many reaches from riparian vegetation, high autochthonous (in stream) production and fouling from filamentous algae, high embeddedness, high siltation, and low detrital habitat complexity (Wissman 1995).

Dutch Oven Creek, below the LSR, had the highest insect diversity of any of the sites. The Dutch Oven insect species indicate cold water and cobbles not embedded in fine sediments. Wisseman (1993) believes that the insects represents a relict community from the Pleistocene because the invertebrate fauna is more typical of moist, maritime and mid-higher elevation western Cascade streams.

Keene Creek has an invertebrate fauna that may have resembled the Dutch Oven Creek assemblage at one time. The community now contains many widely distributed tolerant species with a moderate level of community richness (a diversity index) that Wisseman (1993) attributes to impacts from upslope and riparian logging, poorly constructed roads, grazing and impoundment.

Fish

There are five native fish species in the Jenny Creek LSR: Cutthroat Trout (*Onchorynchus clarki*), Jenny Creek race of the Redband Trout (*Onchorynchus mykiss*), Jenny Creek Sucker (*Catostomus rimiculus*), Speckled Dace (*Rhinichthys osculus*), and Reticulate Sculpin (*Cottus perplexus*). The exotic fish species are: Rainbow Trout (*Onchorynchus mykiss*), Golden Shiner (*Notemigonus cryoleucas*), and Brown Bullhead (*Ictalurus nebulosus*). Cutthroat trout, rainbow trout and Jenny Creek Sucker stream locations are displayed in Map 2-10.

Native Fish

Cutthroat Trout (Onchorynchus clarki)

The Cutthroat Trout (*Onchorynchus clarki*) is found throughout the Emigrant Creek watershed as far as an impassable culvert on BLM road 39-2E-34 just below a high bedrock drop up stream. ODFW found cutthroat trout to headwater reaches near Porcupine Creek in 1997. The Medford Grazing Management Plan EIS (1983) lists cutthroat trout in 0.75 miles of Emigrant Creek, 1.35 miles of Tyler Creek, 0.50 miles of Baldy Creek, 0.30 miles of Green Mountain Creek, and 1.00 mile of Porcupine Creek. Of the extent sampled, 1.65 miles was considered good habitat and 2.25 miles consider good to fair. Cutthroat trout are not known from Jenny Creek or Dutch Oven/Camp creeks.

Redband Trout (*Onchorhynchus mykiss*)

Jenny Creek race of the Redband Trout, a subspecies of the Rainbow Trout (*Onchorhynchus mykiss*) are distributed throughout the Jenny Creek watershed from the lower falls to the Howard Prairie Dam and in all the major tributaries. Keene Creek is an especially important nursery stream (Rossa pers. com. 1998). Redband trout is not known from Emigrant Creek or Camp Creek and its tributaries.

Redband trout is on the U.S. Fish and Wildlife Service "Notice of Review." Unfortunately, the Jenny Creek redband trout is at risk of dilution by hybridization with rainbow trout introduced to Jenny Creek by state agencies and private sources and from Howard Prairie Dam overflow. Fish passage down Keene Creek from Hyatt Dam to Jenny Creek is complicated by Little Hyatt Lake and Keene Creek Reservoir.

Each population of redband trout is genetically distinct because of geographical isolation. Therefore protection of the Jenny Creek race is important. Dilution of the redband gene pool by hybridization might eventually mean the loss of the race and the subspecies. Fortunately, genetic studies by Currens (1990) indicate that some or all of the redband stock remains intact in parts of the watershed. "Redband genes" are important for Jenny Creek trout because redband trout seem to handle low water and high water temperatures beyond the normal range of other salmonids like rainbow trout.

Jenny Creek Sucker (*Catostomus rimiculus*)

The Jenny Creek smallscale sucker is an isolated population of the more wide-spread Klamath smallscale sucker (*Catostomus rimiculus*). It is found above waterfall near the mouth of Jenny Creek not far from where the creek flows into Irongate Reservoir on the Klamath River to a small bedrock chute in upper Jenny Creek (Hohler 1981; Rossa 1998). The much larger Klamath smallscale sucker is prevented from interbreeding with its smaller form upstream by the falls.

The Jenny Creek smallscale sucker was thought to be a dwarf form of its larger relative (Hohler 1981). However, a genetic study (Harris and Currens 1993) found no conclusive evidence that the smaller Jenny Creek form was distinct genetically from the larger Klamath River fish. The possibility exists that the size difference is environmental, caused by nutrition or some other factor.

The Jenny Creek smallscale sucker is on the U.S. Fish and Wildlife "Notice of Review" and the Oregon Department of Fish and Wildlife "Sensitive Species List." More research is need to resolve the size question. The sucker is not known from the upper reaches of the Camp Creek watershed or the Emigrant Creek watershed.

Speckled Dace (*Rhinichthys osculus*)

Speckled dace are the most common native fish in Jenny Creek. They can be found throughout mainstem Jenny Creek and in its larger, slower tributaries. They are most numerous in low-gradient meadow reaches.

Although speckled dace currently do not have any special status, preliminary results from a genetic study (Pfreder and Lynch 1998) indicate the Jenny Creek dace could be genetically distinct. Speckled

dace are wide spread throughout the west, but have not been reported in the other Jenny Creek LSR watersheds.

Reticulate Sculpin (Cottus perplexus)

Visual surveys of Emigrant Creek in 1997 found the reticulate sculpin between the confluences of Tyler and Baldy Creek. It has not been found in the other watersheds in the Jenny Creek LSR.

Exotic Fish

Rainbow Trout (Onchorynchus mykiss)

Rainbow trout, native in other drainages, is regularly stocked in Hyatt and Howard Prairie Lakes. They were introduced into the Jenny Creek watershed by private sources and ODFW in the 1970s and 1980s. Rainbow trout's role in the dilution of the resident redband trout was discussed under that species.

Rainbow trout are resident in Dutch Oven and Camp Creeks from the mouth at Irongate Reservoir to about 1.5 mile above the confluence of the creeks (BLM records). Unlike Jenny Creek, there are no major obstacles between Irongate Reservoir (historically the Klamath River) and the headwaters (ODFW 1997).

Golden Shiner (Notemigonus cryoleucas)

Golden shiners are introduced fish in the four Jenny Creek watershed reservoirs and occasionally escape downstream with overflow water. Their distribution, survival, and impact on the Jenny Creek ecosystem is not known. They have not been reported in the Emigrant Creek or the Camp Creek drainages.

Brown Bullhead (Ictalurus nebulosus)

Brown bullheads are found in the headwater reservoirs of Jenny Creek and have been responsible for the destruction of the trout fishery in Hyatt Lake twice, requiring rotenone poisoning of the lake. They occasionally escape downstream into the Jenny Creek watershed. Bullhead distribution, survival, and impact on the Jenny Creek ecosystem is not known. They have not been reported in the Camp Creek or Emigrant Creek drainages.

DISTURBANCE AGENTS

Ecological processes, such as wind, insects, disease, drought, earthquakes, lightning strikes, and particularly lightning-caused fires, regularly sculpted the native forests creating a natural landscape that is a reflection of its past environment. It is important to recognize which natural processes are involved in maintaining the healthy LSOG forests. Forest ecosystems have been evolving for thousands of years. The composition, structure, and ecological processes of the forests are thus a product of their dynamic physical environment. Natural disturbances affect species composition, density, tree distribution, and growth (Sensenig 1997). As a result these processes, forest structures

develop specific forms of habitat. Pathogens and fire are the predominant and most influential natural disturbances controlling the development of LSOG forests in southwest Oregon and the Jenny Creek LSR.

Insects and pathogens are often predictable agents of change currently present in the Jenny Creek LSR and surrounding areas. Individually or acting together they can decrease growth and cause mortality in individual trees. At a landscape level, they influence stand structure, composition, and function within forest ecosystems by creating canopy gaps, altering plant succession, creating decay columns and snags, which contribute woody material to the forest floor and streams. Insect and disease influences may be beneficial or detrimental to development and maintenance of conditions, depending upon the mix of hosts, insects, and pathogens; current weather patterns; fire history; host species composition; host vigor; and past management activities.

Diseases

Laminated root rot, caused by *Phellinus weirii* (Basidiomycota), is the most damaging tree disease in the Jenny Creek LSR. This disease is found on at least 3,000 acres of mixed conifer and white fir forest lands with a mixed sugar pine/incense cedar/white fir understory. See Map 2-11 for large pockets of root rot within the LSR. On some sites, large, individual sugar pine have survived for 600 years, while generations of surrounding Douglas-fir and white fir grew, matured, and then succumbed to laminated root rot.

Laminated root rot has always been present at some level on these sites for centuries. Good examples of the establishment of shade intolerant pine and incense cedar in gaps caused by the death of firs by laminated root rot are found in the Soda Jenny timber sale and Crane Prairie areas. Here, laminated root rot causes extensive growth declines, decay, and mortality among susceptible white fir and Douglas-fir. Lodgepole pine and sugar pine are tolerant, while ponderosa pine and incense cedar are resistant. Approximately 400 acres of LSOG forest in the area with laminated root rot were clearcut and planted to pine plantations. Eighty years of fire suppression has caused a shift to dense stands of more intolerant white fir and Douglas-fir that stress the older pines and cedars. The last stand replacing wildfire event in this area was in 1910.

Annosus root disease caused by *Heterobasidion annosum* (Basidiomycota) damages white fir in the Jenny Creek LSR. Several incidences of *Annosus* root rot have been noted in cutover areas where it has colonized stumps from previous stand entries and infected conifer regeneration in the vicinity. Infection occurs when roots from healthy trees come in contact with infected root material. Ten or twenty years after harvest, a significant proportion of the residual stand and subsequent reproduction often shows a large proportion of *Annosus* infection, mainly in the form of butt rot, windthrow, and stem breakage.

Other root or butt rot diseases observed in the area include shoestring root rot (*Armellaria mellea*) and velvet top (*Polyporous schweinitzii*). Black stain root disease (*Verticicladiella wagonerii*) was surveyed in 1986. No reported infection centers were observed on Douglas-fir or ponderosa pine

because few Douglas-fir plantations of the age class (10-30 years) are found in the Jenny Creek LSR due to the severe frost problems associated with clearcuts.

White pine blister rust on sugar pine is caused by *Cronartium ribicola* introduced from Europe around 1910. It causes topkill and flagging of small branches on large trees and mortality of poles, saplings, and seedlings due to girdling cankers. To date, of 50 sugar pine tested within the LSR, 29 have shown resistance. Seedlings from resistant parents have been planted in partial cut stands and gaps. Significant sugar pine mortality has been observed on seedlings and saplings in several areas within the LSR. Because sugar pine normally becomes established by seeding into gaps in mixed conifer stands, mortality of small sugar pine is significantly altering future forest structure because Incense cedar, white fir, and Douglas-fir fill these gaps instead. Presently, young sugar pine are not occupying these sites.

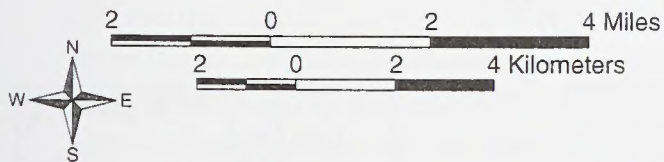
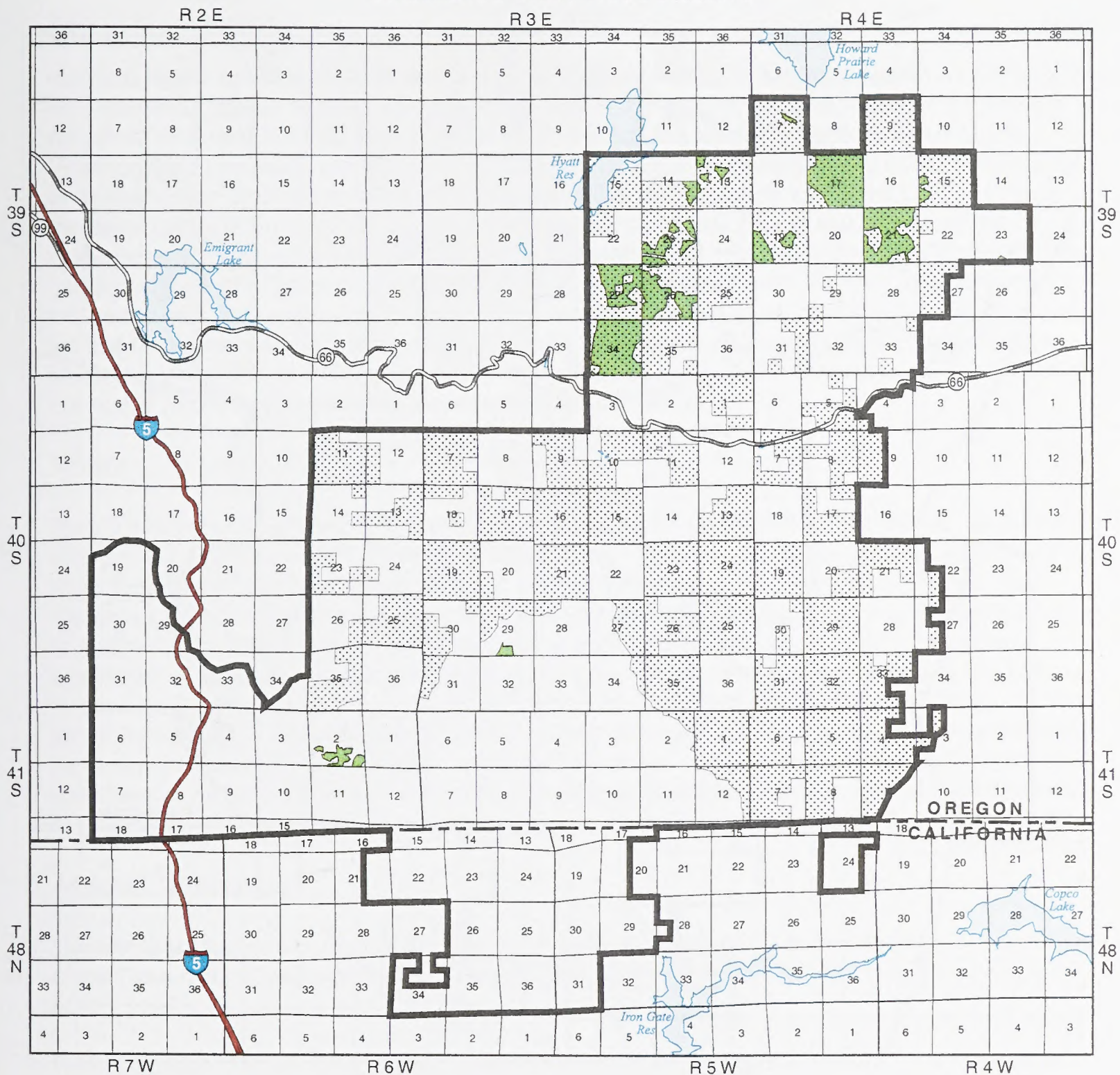
Common heart rot or decay column causing pathogens include *Polyporous amarus* on incense cedar, *Phellinus pini* on Douglas-fir, and *Echinodontium tinctorium* on white fir. These necessary and beneficial fungi create habitat used by cavity nesters and dwellers. Heart rots usually do not cause mortality because they grow for decades with the maturing tree. The resulting cavities provide nesting habitat for decades in LSOG stands.

Dwarf mistletoe on Douglas-fir and white fir is common. The most significant impacts on tree growth and survival occur in multi-storied Douglas-fir stands where partial cutting and fire exclusion have created uneven-aged stands resulting in higher infection levels and increased occurrence of Douglas-fir mistletoe (*Arcuethobium douglasii*). It is recognized by its aerial shoots accompanied by host stem swelling and multiple branching pattern called witches brooms. Some level of dwarf mistletoe in a stand is desirable for future old-growth tree character and structure, as well as NSO habitat. Douglas-fir in particular develops brooms, which are important to wildlife. Large brooms that form over the course of several years on large old-growth trees are desirable habitat and irreplaceable in the short term. Development of old-growth character from heavily infected trees in overstocked understory is unlikely due to infection of the actively growing tops on intermediate to small trees. Historically, many of the smaller infected trees were removed from the stand by wildfires. Presently, infected understory trees are acting as fuel ladders that increase the likelihood of killing the larger overstory stand components. Areas in the LSR, such as Fredenburg Springs, are good examples of the fuel ladder problem.

Insects

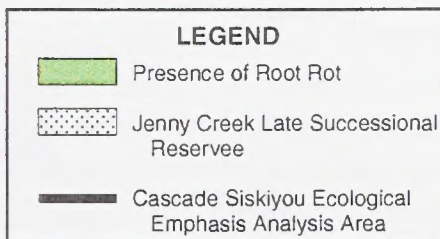
Several primary tree killing insects are present in the LSR: western pine beetle (*Dendroctonus brevicomis*) on ponderosa pine; mountain pine beetle (*D. ponderosae*), red turpentine beetle (*D. valens*) and pine engravers (*Ips spp.*) on sugar and ponderosa pine; Douglas-fir beetle (*D. psuedotsugae*) on Douglas-fir; and fir engraver (*Scolytus ventralis*) on white fir. Recently insect species associated with pine have significantly effected large old trees due to stress associated with dense stocking of white fir in the understory and drought. Pine bark beetles are a potential problem in young stands and plantations as well. Higher stand densities increase risk to trees that are less

Jenny Creek Late Successional Reserve Laminated Root Rot Presence



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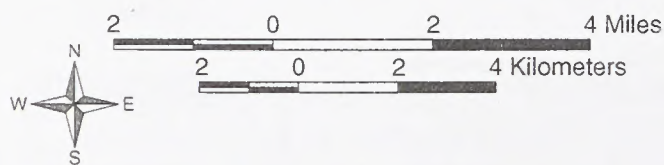
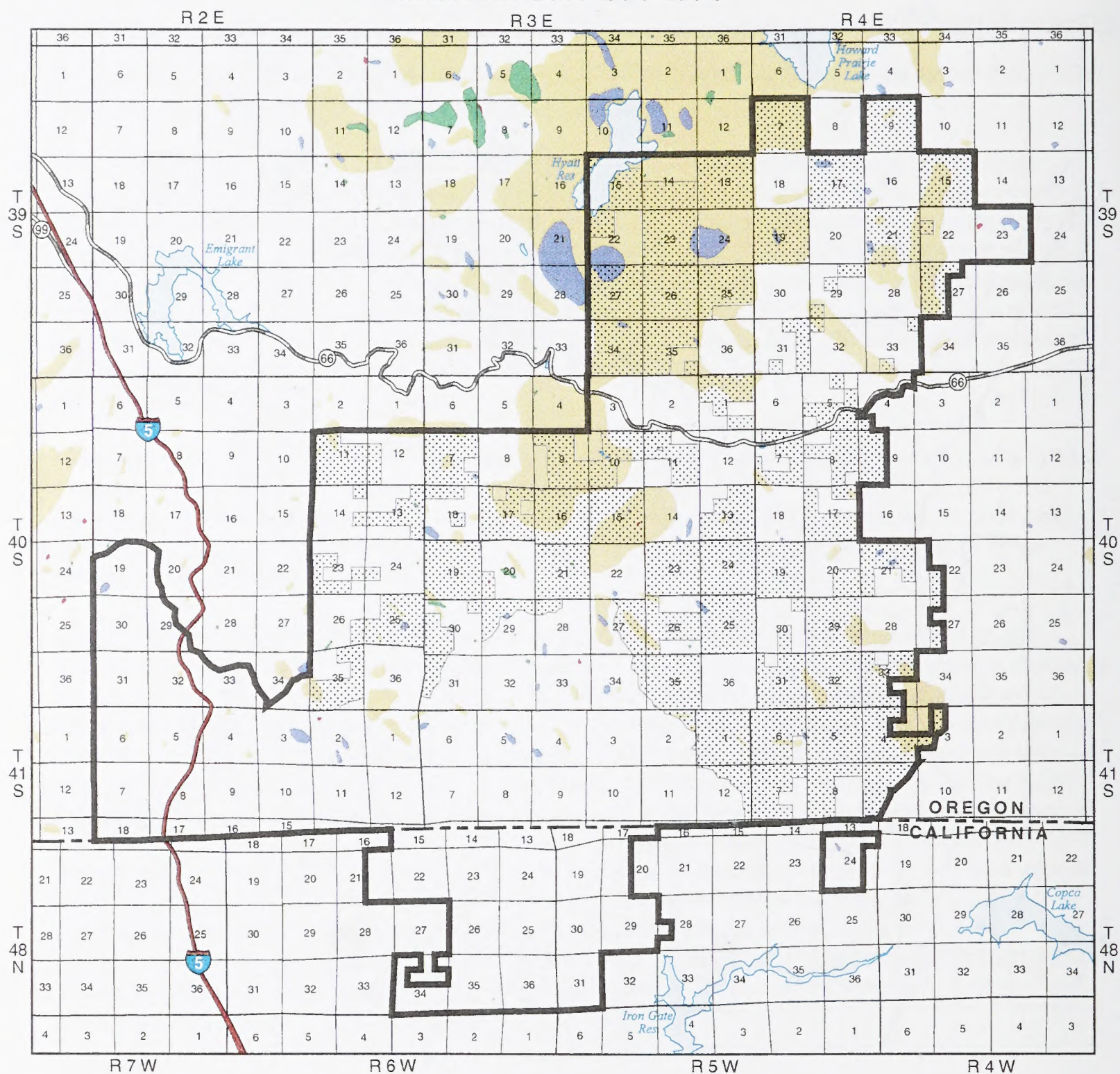
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MAP 2-11

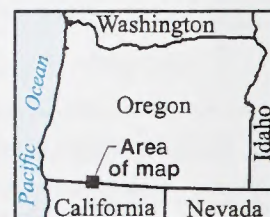
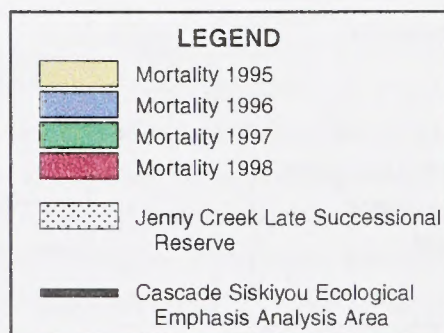
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Jenny Creek Late Successional Reserve Insect Incident 1995-1998



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MAP 2-12

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vigorous, water stressed and therefore less capable of responding to invading beetles by pitching them out. Generally, stands with growth rates exceeding or equal to 1.5 inches of diameter growth per decade or with less than 150 square feet of basal area are less prone to pine bark beetle attack. Homogeneous ponderosa pine plantations are found throughout the LSR due to historic clearcutting practices. Sugar pine and ponderosa pine are being lost in many areas within the LSR as a result of increased competition by white fir and subsequent insect attacks. Blister rust on sugar pine exacerbates insect attack. Fir engraver activity associated with root rots is another example of trees being predisposed to insect outbreaks due to an existing stress problem. Mixed Conifer plant series with more than 40% of the stand composition occupied by white fir and that exceed the site potential for that plant association are considered at risk for fir engraver. Historic references record major beetle infestations from 1925 to 1934. Periodic and local infestations continue to occur over the area. For recent insect incidences locations between 1995-98 see Map 2-12.

Wind

High winds periodically cause windthrow in managed forest stands and natural stands. Blowdown is common on ridges especially when soils are saturated. Trees that are shallow rooted as result of high water tables have increased susceptibility to windthrow during storms, particularly where the canopies have been significantly disturbed during partial harvest or thinning. Heavy snowfall accompanied by high winds during severe winter storms result in increased tree breakage and windthrow of white fir and other tree species. The most severe blowdown problems in the LSR in recent history have been when the overstory canopy has been disturbed following thinning or other partial harvesting. Clearcuts harvest, and associated with property boundaries, have exposed forest stand edges to direct wind resulting in increased blowdown. Open areas and roads exacerbate wind tunnel circumstances wherein windthrow at the edges of intact forest stands gradually erodes stand integrity. All of these situations have contributed to forest fragmentation in the Jenny Creek LSR.

Animal Influences

Most animal problems in the LSOG capable lands are associated with favorable habitat conditions created as a result of regeneration harvesting. Only incidental problems have been noted in intact LSOG forests.

Pocket gophers (*Thomomys sp.*) have posed the most significant animal problem to reforestation following timber harvest. Historic regeneration practices have converted LSOG forests to forb and grasslands for extensive period. This is ideal habitat for gophers. Coupled with severe frost, only lodgepole, Jeffrey and ponderosa pine can be successfully planted, being the only species that can survive successfully in the created environment. In those conditions gopher predation is severe causes continued seedling mortality for up to five or more years. Mortality is often as high as 90 percent of stocking in a single year. Control methods have been of limited success. Gopher populations fluctuate rapidly due to weather, altitude, soil characteristics, and food quality and quantity. Coupled with porcupine populations there can be an extensive time of early seral vegetation due to animal predation on young conifers and this early seral stage, with low stocking of conifers,

can persist for up to 40 years of age. Some of the regeneration harvested exchange lands, as well as BLM managed lands, have been extremely difficult to regenerate or restore at the high elevations (white fir and mixed conifer communities) that characterize most of the productive conifer areas within the Jenny Creek LSR.

Gophers, well a pest to timber managers, are a major prey base providing food for a host of small and medium-sized predators, including spotted and great grey owls, coyote, and various snakes and weasels. They are also suspected of playing a role in maintenance of vernal mound topography outside LS/OG forest communities.

Deer and elk often nip buds and browse seedlings or saplings, slowing down tree establishment, but are generally not a large problem in this area. Cattle are only a problem in small areas where they congregate for shade and water. They are a positive factor in decreasing grass competition in pine plantations beyond 4 to 5 years in age where trees are too large to be trampled. Overall, cattle are not a significant problem to reforestation efforts within the LSR.

Timber Harvest

The first timber harvesting in the Jenny Creek LSR occurred around the turn of the century with economic selection for the best quality old-growth ponderosa pine, sugar pine and Douglas-fir trees (Larsen 1976). The Oregon and California Revested Lands Sustained Yield Act of 1937 established timber harvest as the primary use of BLM forest lands in western Oregon.

Large scale salvage logging, partial harvests, and selective logging began in the 1940s to provide ammunition shell crate boxes. During the 1950s and 1960s, shelterwoods, a few seed trees and clearcuts, and group selection harvesting was practiced.. In shelterwoods individual seed trees were usually lost to high winds common at these upper elevations and these regeneration cuts over time came to resemble clearcuts. By the 1970s, logging practices shifted "mortality-salvage"/selection operations to more and larger regeneration harvesting. Three-step shelterwood was generally practiced. LSOG stands were often entered in the form of large-scale developmental sales that were planned in order to enter an "undeveloped" area with some regeneration harvest and the areas between mortality salvaged to establish the road systems for future sales. The 1980s saw a continued increase in clearcutting despite recognized problems with reforestation as a result of these practices (Minore 1978). Of the BLM-administered forest lands, approximately 81% has a timber harvest history; approximately 6% has had some form of regeneration harvest that have produced plantations (Table 2-3).

Timber sales have involved removal of significant LSOG forest components in the Chinquapin Mountain, Beaver Creek, and Lincoln Creek areas in the late 1980s. Those regeneration harvested areas are occupied by young even-aged pure pine plantations. The clearcutting on private lands both within and adjacent to the LSR involved the removal of whole sections of LSOG forest and most regenerated as pure pine plantations. Private forest lands continue to be clearcut and most not

clearcut have been harvested too heavily to continue functioning as suitable NSO habitat. Some may function marginally as dispersal habitat.

Intermingled Private Lands

Private lands intermingled within the LSR account for approximately 32,700 acres or 47 percent of the gross LSR acreage. Some may function as dispersal habitat but none is projected to provide long term suitable NSO habitat. Some unknown, probably small, quantity of suitable habitat (NSO Habitat Types 1 and 2) may currently exist on these private lands but it is projected most will be harvested within the next 5 to 10 years given the rate of private land harvesting within the Jenny Creek LSR area.

Private lands currently provide some level of dispersal habitat (Habitat Types 5 and 6), although the actual amount is unknown. They can be expected to continue providing dispersal habitat in fluctuating amounts through time. The stand conditions required for dispersal habitat (40 to 60 years) usually develop within the time frame of the short rotations used by timber land managers. Small woodland (and some industrial) owners in the area provide dispersal habitat on their lands intentionally or serendipitously due to their partial harvesting management practices.

Wildfire Risk and Fuels

Lightning fires and human caused have been a source of disturbance to landscapes in interior southwest Oregon for thousands of years. Like other natural agents of disturbance fire has a strong influence which shapes the successional processes, ecosystem structure, and biochemical cycles. Most forests and grasslands in the LSR and their associated species are fire-adapted. Some of the ecosystems are able to survive frequent, low-intensity fires.

It is estimated that prior to European settlement low severity fires occurred at 3 to 7 year intervals in portions of the LSR chaparral, scrubland and grassland plant communities. Severe fires that left fire scars on trees occurred at 20 to 40 year intervals (Figure 1-1).

During the early 1900s wildfires were considered detrimental to habitation and forest resources. Recent database information from the Oregon Department of Forestry for the 1966 to 1995 period shows fire suppression has been quite effective. A total of 102 fires occurred throughout the LSR and of these fires, 85 fires covered less than 0.25 acres (Class A fire) and 17 fires were between 10 and 100 acres in size (Class D fire) (see Table below). For the LSR and surrounding areas, distribution and size of recent wildfires is shown in Map 2-13 and their danger class is shown in Map 2-14.

As a result of fire suppression has resulted in substantial accumulations of understory vegetation and fuels. This "over-accumulated vegetation" predisposes some areas to severe wildfire, potentially placing watershed, species, and people at risk during extreme fire situations such as occurred in surrounding areas in 1987.

Prior to fire suppression many stands were relatively open, tree crowns were separated and laying and density of understory were less frequent. Perennial riparian areas had relatively open understories and were less susceptible to fire. It is well established that fire, as a prominent disturbance factor, played a major role in the patterning of vegetation stand structure and mosaics in this landscape.

The following discussion considers risk factors and likelihood of severe fires within the Jenny Creek LSR.

Wildfire Risk

Risk is the probability of a wildfire occurring within a given area. Historical records show that lightning and human caused fires are common in the LSR, with lightning being the primary source of fire starts. Other activities within the LSR such as established campgrounds, dispersed camp sites, recreational use, and major travel corridors add to the possibility of a fire occurring from human causes.

A statistical fire risk analysis was completed for the Jenny Creek LSR using the computer program PROBACRE. The program calculates the probability of a large wildfire event occurring within the LSR utilizing the Poisson distribution. The fire history data from 1966 to 1995 (described above) was used in this program. The annual fire frequency rates for each of the fire sizes used in this program are shown below:

Size Class	Number of Fires	Annual Fire Frequency
0.25 acres	85	2.93
10 acres	15	0.52
100 acres	2	0.01

The annual fire frequencies were entered and the probability of occurrence for 10, 25, 50, 75, and 100 year periods were calculated. Threshold acres were set at 6,674 acres, 16,684 acres and 33,371 acres (25, 50, and 75 percent of the LSR respectively). Results from PROBACRE program for the probability of occurrence for a 25 year period is displayed in Table 2-23:

Table 2-23. Probability of wildfires in a 25-year period

Fire Size Class	Fire Frequency		Probability of Number of Fires per 25 year Period (percent)					
	Annual	Period	None	One	Two	Three	Four	> Four
0.25	2.93	73.25	0.0	0.0	0.0	0.0	0.0	100
10	0.52	13.00	0.0	0.0	0.0	0.0	0.0	100
100	0.07	1.75	17	30	27	16	7	3

The time of year most conducive for fires to occur in the LSR is from July through September. Information from the Oregon Department of Forestry database shows lightning accounted for 71 percent of the total fires throughout the LSR between the years 1967 and 1998. Utilizing the last 10 years of this data shows lightning still accounted for 71 percent of the fires.

Results from PROBACRE showed it is highly unlikely in the next 100 years that the 6,674 acre threshold would be reached. These results indicate that probability of a large, severe fire covering at least 25% of the LSR area, is relatively low. Explanation of the PROBACRE program and results can be found in Appendix J.

Fire history data was also used to assess fire risk for the LSR. This assessment of risk utilized the total number of fire starts over a given period of time for the LSR. The value derived corresponds to the likelihood of fire starts per 1,000 acres per decade. Again the results showed that the likelihood of a catastrophic fire is relatively low fire. The formula used to arrive at this rating can be found in Appendix J.

The threat of fire entering the LSR from a start outside was not included in the analysis, but based on vegetative conditions, the occurrence of fire on lands adjacent to the LSR is very similar to those which recently occurred within the LSR. An exception to this assumption can be found in the adjacent lands to the south. Vegetative conditions, aspect, topography, and restricted access for suppression forces are such that under severe wildfire conditions (such as in 1987) there is a higher probability of fires starting in those areas and entering the LSR.

Fuel Models

Wildfire behavior is predicted in order to determine the potential damage likely to resources if a wildfire were to occur. Predicting fire behavior has been aided by the development of thirteen standardized fuel models. These models depict the amount and type of fuel available to support a fire. There are four general categories of fuel models: grass, shrub, timber litter, and slash. The thirteen fuel models were used to estimate fire behavior during the period of the fire season when wildfire presents the greatest potential threat to resources (Anderson 1982). The differences in these groups are related to the fuel load and distribution of fuel among size classes. Size classes are: 0-1/4" (1 hour fuels), 1/4-1" (10 hour fuels), 1-3" (100 hour fuels), and 3" and greater (1,000 hour fuels). Table 2-24 summarizes each fuel model, definitions (USDA 1982), and percentage of Jenny Creek LSR within these fuel complexes.

The majority of Jenny Creek LSR are found within Fuel Model 8 (40 percent) and Fuel Model 10 (21 percent):

- Fuel Model 8 represents slow burning ground fires with low flame lengths. Occasional heavy fuel loadings occur, which would result in small flare ups.

- Fuel Model 10 represents fires that burn on the surface with the greatest fire intensities of all the timber litter models. Crowning, spotting, and torching of individual trees are more frequent than in Fuel Model 8, which could lead to fire control problems. Stands with high densities face an increased potential for a stand replacement fire.

Table 2-24. Fire behavior fuel model's typical fuel complexes, fuel loading levels, fuel depth and percentage of Jenny Creek LSR within each fuel complex

Fuel Model Typical Fuel Complex	Fuel Loading by Size Classes tons/acre				Fuel Bed Depth in ft.	Percentage of Jenny Creek LSR by fuel complex
	1 Hr	10 Hr	100 Hr	Live		
GRASS AND GRASS-DOMINATED						
1-Short Grass (1 ft.)	0.74	0.00	0.00	0.00	1.0	3%
2-Timber (Grass and understory)	2.00	1.00	0.50	0.50	1.0	20%
3-Tall Grass (2 ft.)	3.01	0.00	0.00	0.00	--	<1%
CHAPARRAL AND SHRUB FIELDS						
4-Chaparral (6 ft.)	5.01	4.01	2.00	5.01	6.0	<1%
5-Brush (2 ft.)	1.00	0.50	0.00	2.00	2.0	11%
6-Dormant Shrub & Hardwood. Slash	1.50	2.50	2.00	0.00	2:5	3%
7-Southern Rough	1.13	1.87	1.50	0.37	2.5	--
TIMBER LITTER						
8-Closed Timber Litter	1.50	1.00	2.50	0.00	0.2	40%
9-Hardwood Litter	2.92	0.41	0.15	0.00	0.2	<1%
10-Timber (Litter and Understory)	3.01	2.00	5.01	2.00	1.0	21%
SLASH						
11-Light Logging Slash	1.50	4.51	5.51	0.00	1.0	<1%
12-Medium Logging Slash	4.01	14.03	16.53	0.00	2.3	<1%
13-Heavy Logging Slash	7.01	23.04	28.05	0.00	3.0	0%

Fire Hazard

Fire hazard assesses vegetation by type, arrangement, volume, condition and location. These characteristics combine to determine the threat of fire ignition, spread and difficulty of control. Hazard ratings were developed for the LSR using fuel models, aspect, elevation, and slope. See Appendix J for how hazard ratings were developed. The distribution of the different fuel hazard ratings across the LSR is given in Map 2-15. Table 2-25 summarizes the percentage of the LSR acreage within each fire hazard rating.

Table 2-25. Fire hazard ratings for the Jenny Creek LSR

Fire Hazard Rating	Percentage of LSR Acreage
Low hazard	2%
Moderate hazard	86%
High hazard	12%

Fire Behavior Potential

Fire behavior potential was modeled for the LSR by incorporating the thirteen standardized fuel models, 90th percentile weather data, stand data and topographic data. Fires in areas of moderate to high fire behavior potential are difficult to control because of their associated flame length. Flame length is a good indicator of fire line intensity and the rate of fire spread. Information regarding flame length will portray how resistant to control an area will be if ignited under weather conditions typical of late summer afternoons. Resistance to control gives an indication of the likelihood that a stand would be lost to a wildfire. Predicted fire behavior will decrease or increase dependent on the actual weather if a wildfire starts outside the 90th percentile weather conditions.

The 90th percentile weather data was used from historic weather data from the most representative weather station, the Parker Mountain remote automated weather station. The 90th percentile weather, which is the severest 10 percent of historical weather conditions, is the most representative of late afternoons from July through September and is a standard used when calculating fire behavior. The following is the weather data used to predict fire behavior potential:

1-hr fuel moisture	3%
10-hour fuel moisture	4%
100-hour fuel moisture	8%
Live herbaceous fuel moisture	80%
Live woody fuel moisture	100%
Wind	7 mph from the SE
Temperature	91°
Relative Humidity	18%

Potential wildfire behavior for the Jenny Creek LSR was obtained from the FARSITE model using flame length as an output. The three categories of flame length output utilized from the model are:

- flame length <4'
- flame length 4' - 8'
- flame length >8'

Based on these categories, predictions were made as to whether or not a fire could be contained when these flame lengths occurred on the landscape. Limited access and steeper slopes also limit the probability that a fire can be contained. The prediction of whether a fire can be contained or not assumes that fire suppression resources are available and fires are accessible. Past history regarding suppression efforts indicates that accessibility and availability of resources have not been a factor within the Jenny Creek LSR. See Table 2-26.

The majority of the LSR (78%) has been identified as areas of low fire behavior where a fire could be contained. These are areas where flame lengths are less than four feet and would allow for direct attack by fire crews with hand firelines in an effort to control the fire. Burning is limited to understory vegetation.

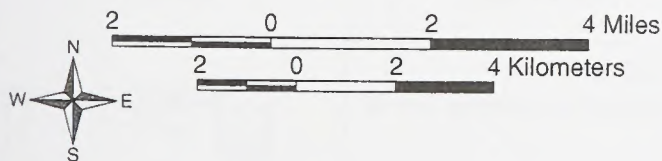
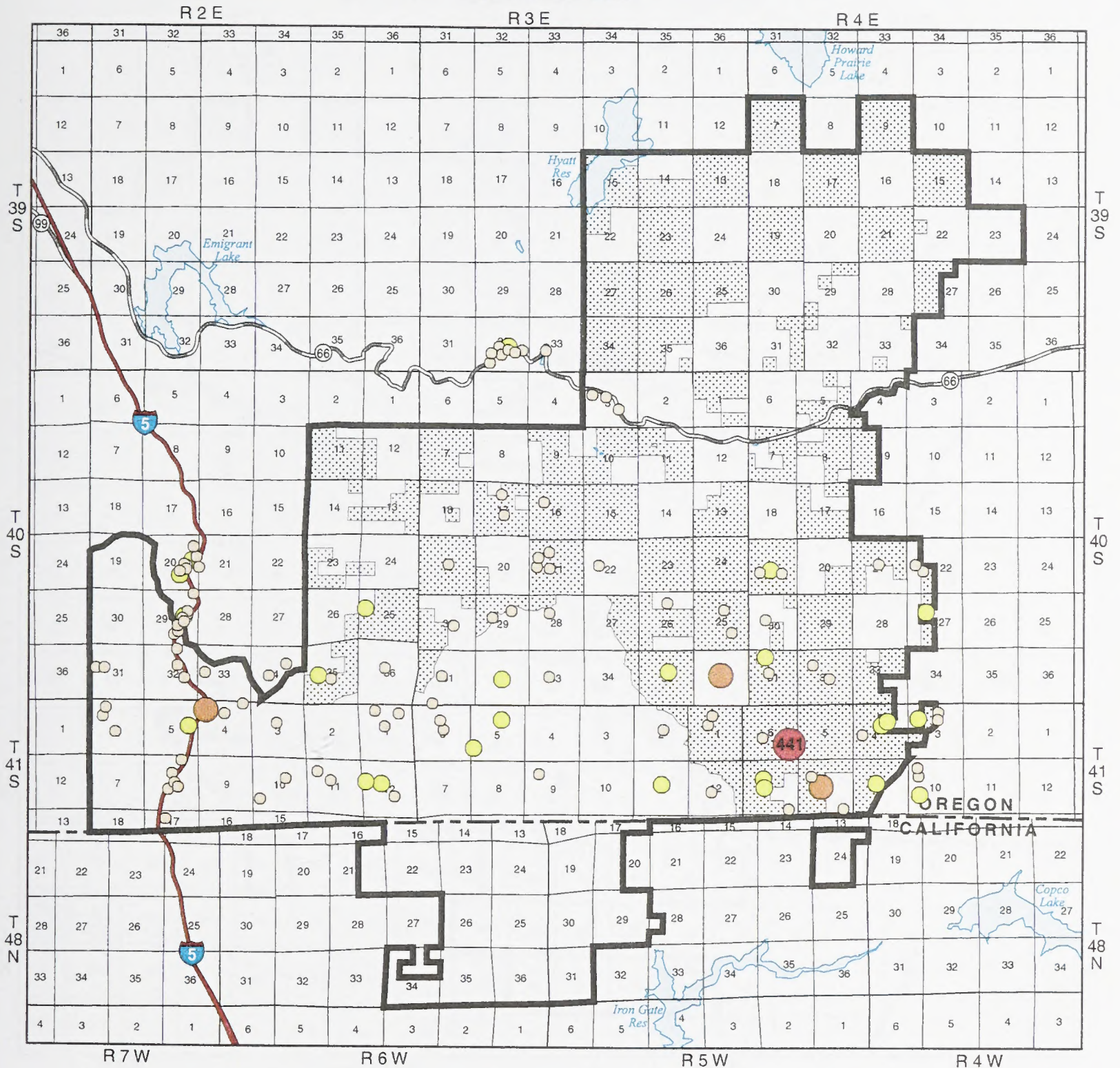
The moderate fire behavior category (21% of the LSR) has been identified as areas where there is a good chance of fire containment. Flame lengths are between 4-8 feet and are generally too intense for direct attack. Hand constructed firelines alone would not be sufficient in controlling fires. Heavy equipment (dozers), and retardant would be most effective.

The high fire behavior category (1% of the LSR) represents areas where fires cannot be contained. These are areas in which production rates of suppression forces are less than the perimeter growth of a fire resulting from a fire which is out of control. These areas are identified as having flame lengths greater than 8 feet and pose the greatest problem for suppression forces. Torching, spotting and crown fires occur, therefore, it is assumed that fires cannot be contained.

Table 2-26. Fire behavior control potential within the LSR

Fire Behavior Potential	Ability to Suppress	Percentage of the LSR Acreage
Flame lengths <4' Low fire behavior	Can contain fire	78%
Flame lengths 4-8' Moderate fire behavior	Good chance of containment	21%
Flame lengths >8' High fire behavior	Cannot contain	1%

Jenny Creek Late Successional Reserve Wildfire Size



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LEGEND

Wildfire Size in Burned Acreage, 1967-98

- 0 to 0.25
- 0.26 to 10
- 10.01 to 100
- 441 Greater than 100 (actual value listed)

No Data Currently Available in California

▨ Jenny Creek Late Successional Reserve

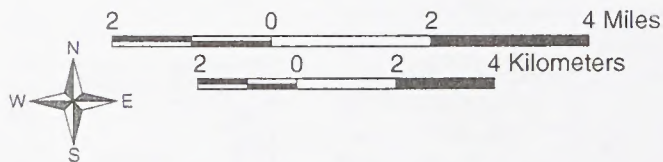
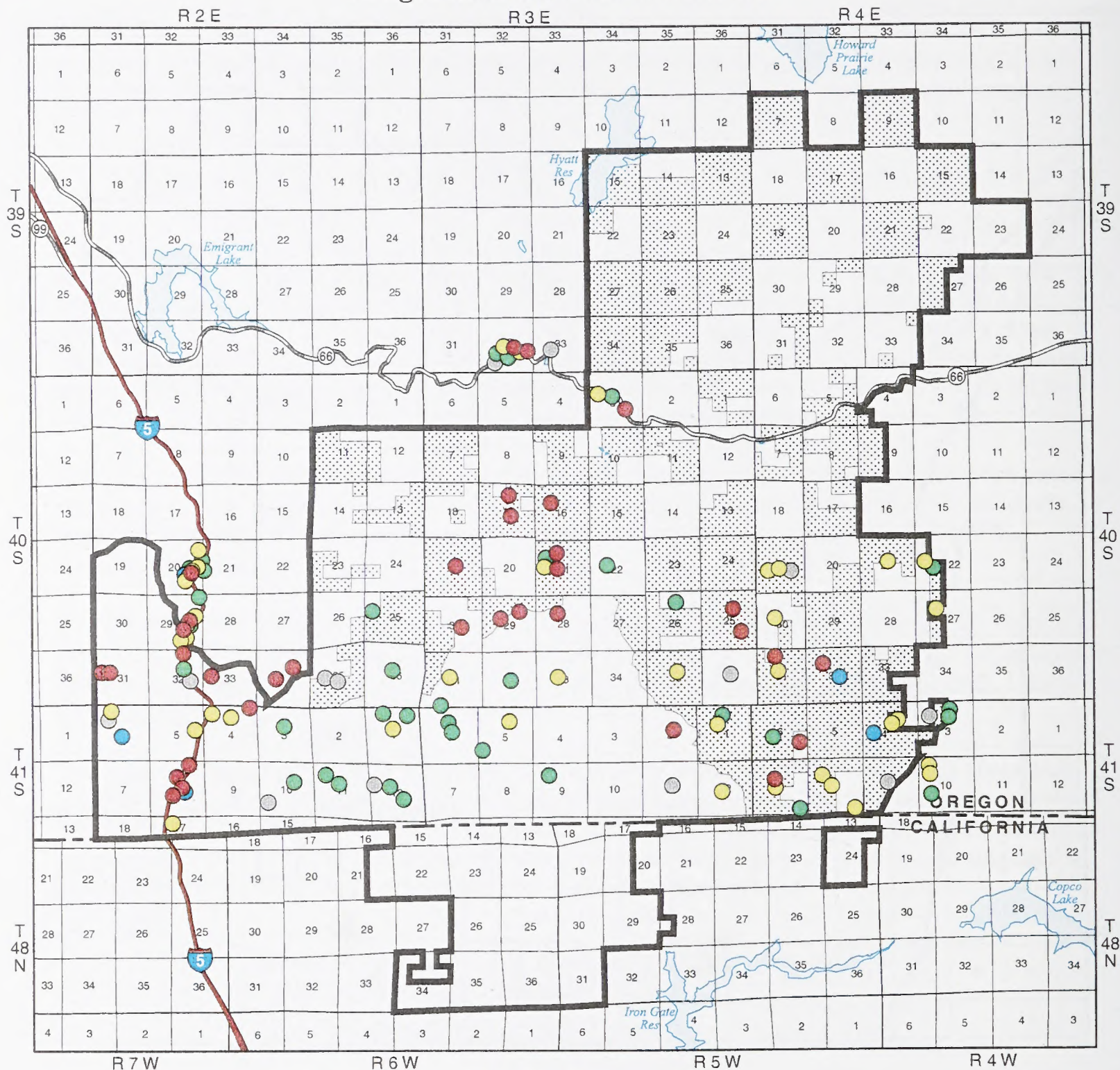
— Cascade Siskiyou Ecological
Emphasis Analysis Area

Fire statistics: ODF, 1967-98, J. Wolf



MAP 2-13

Jenny Creek Late Successional Reserve Danger Classification of Wildfire



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phosten://firegreg/sodapaul.apr

LEGEND

Danger Classification of Wildfire 1967-98

- Extreme
- High
- Moderate
- Low
- Not During Fire Season

No Data Currently Available in California

- Jenny Creek Late Successional Reserve
- Cascade Siskiyou Ecological Emphasis Analysis Area

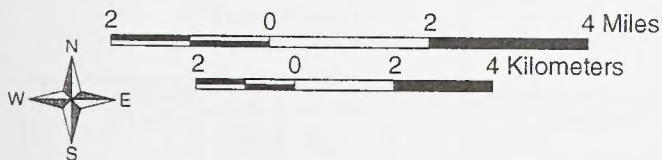
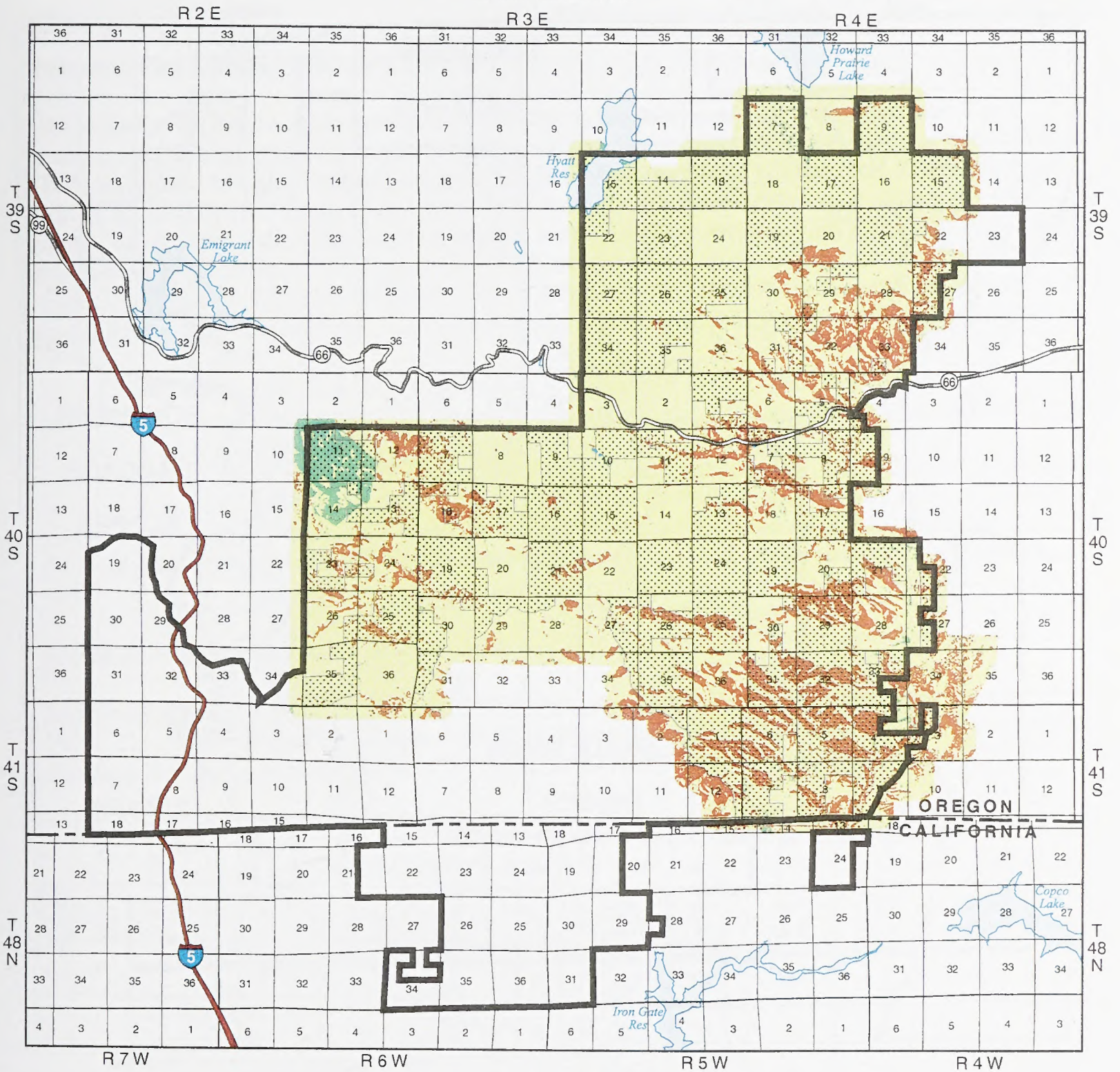
Fire statistics: ODF, 1967-98, J. Wolf



MAP 2-14

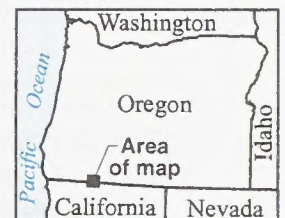
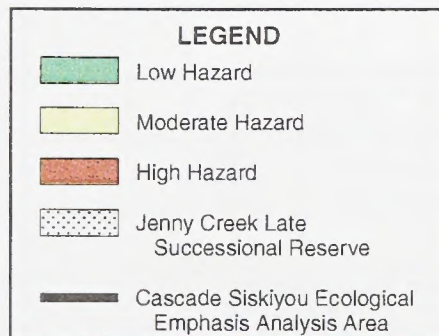
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Jenny Creek Late Successional Reserve Fuel Hazard



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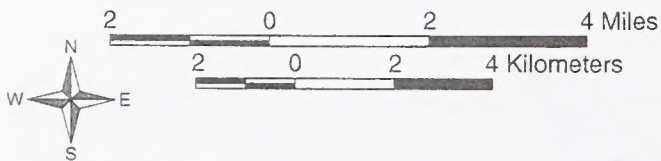
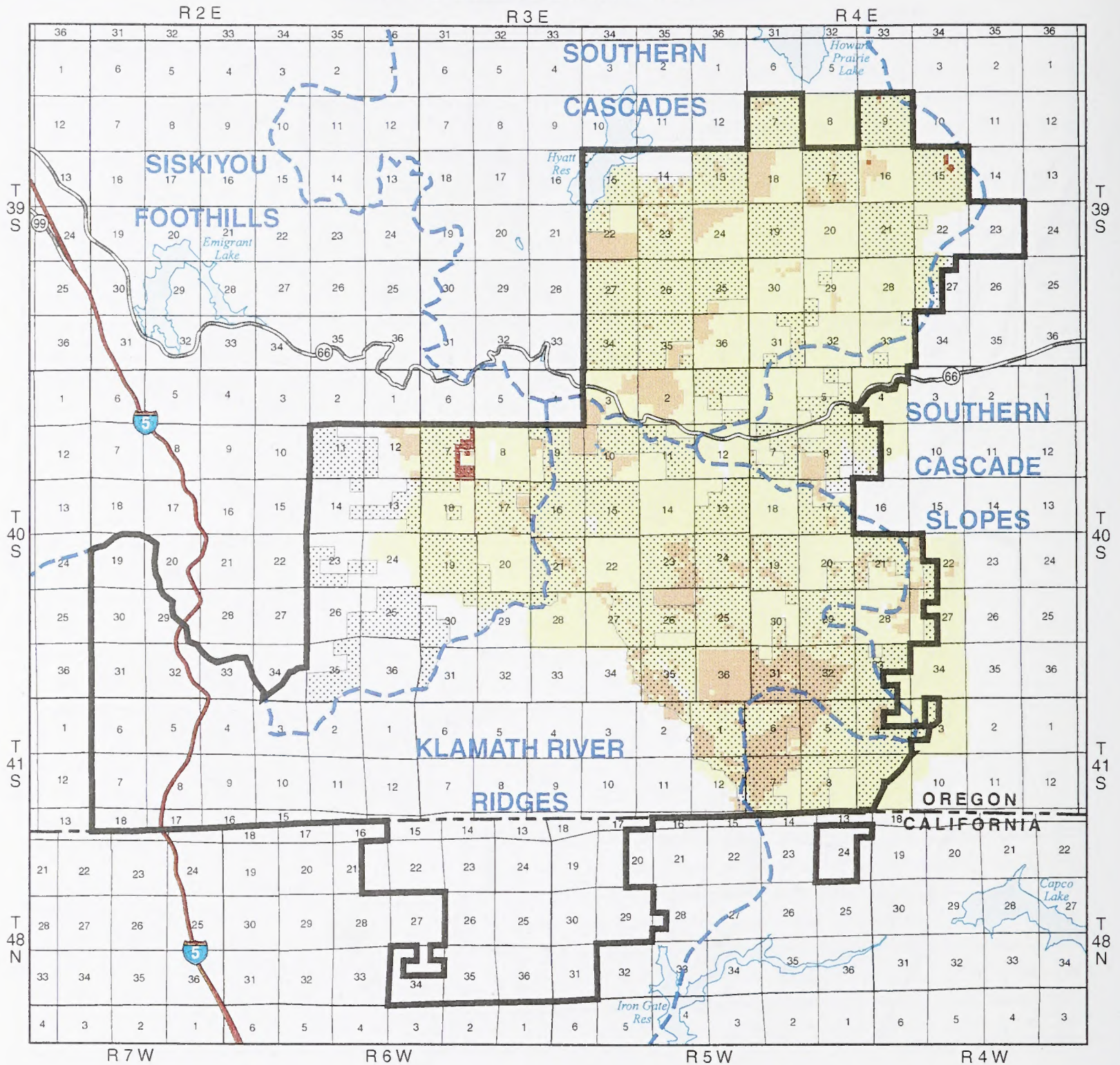
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MAP 2-15

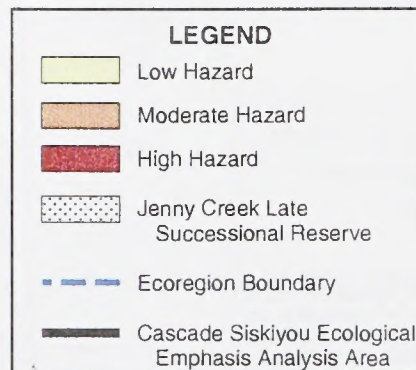
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Jenny Creek Late Successional Reserve Potential Fire Behavior



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MAP 2-16

D03-02-00:JR

Potential Fire Effects - Mortality Ratings

The potential for fire to cause damage to a resource is the sole reason for fire protection. The resource which is of greatest concern is maintenance and protection old-growth and mature habitat (Habitat Types 1 and 2). The First Order Fire Effects Model (FOFEM) (Keane and others 1994) provides a quantitative means to calculate the probability of mortality to a stand of timber. The model, using flame length, predicts mortality to individual tree species within a diameter class. Using this model, in combination with the three general categories for flame length from the FARSITE model, mortality to NSO Habitat Types 1 and 2 habitat was predicted. See Appendix J for an explanation of the process used. A mortality rating was assigned based on the following criteria:

- Non-Lethal* Less than 25% mortality of the entire stand. No reforestation would be needed in these areas. The majority of mortality will occur to trees in the smallest diameter classes.
- Mixed* Mortality will range from 25-60% of the stems within the stand. A high percent of mortality will occur to the smaller diameter classes as well as some mortality to the middle diameter classes. Some reforestation should be expected.
- Lethal* Greater than 60% mortality of the entire stand. Reforestation efforts will be required.

Potential Wildfire Effects on NSO Habitat

Stand exam data was collected for the 18 NSO Activity Centers within the LSR in the summer of 1998. This data was used to develop a table displaying the average number of trees/acre by species and diameter class which exist within the model NSO Habitat Types 1 and 2, see Table 2-27.

Table 2-27. Average trees per acre by species and diameter within Habitat Types 1 & 2 (18 NSO Activity Centers)

Species	10" DBH	14" DBH	18" DBH	22" DBH	26" DBH	30" DBH	34" DBH	35"+ DBH
Douglas-fir	17	14	12	6	4	3	2	2
Incense Cedar	8	6	6	2	1	1	1	2
Ponderosa Pine	0	0	1	1	0	0	0	1
Sugar Pine	0	1	0	1	0	0	0	1
White Fir	40	21	11	7	3	2	1	1
Total stems/Acre	65	42	30	17	8	6	4	7
% of Total Stems/Acre by Diameter Class	36%	23%	17%	10%	5%	3%	2%	4%

Utilizing the predicted flame lengths from the FARSITE model, the expected mortality by three flame lengths (3, 7, and 10-foot) is given in Tables 2-28 to 2-30.

Table 2-28. Three-foot flame length tree mortality by species and DBH class *

Species	10" DBH	14" DBH	18" DBH	22" DBH	26" DBH	30" DBH	34" DBH	35"> DBH
Douglas-fir	25%	14%	8%	5%	4%	3%	2%	2%
Incense Cedar	43%	29%	19%	13%	9%	7%	5%	5%
Ponderosa Pine	NA	NA	11%	7%	NA	NA	NA	3%
Sugar Pine	NA	46%	NA	28%	NA	NA	NA	13%
White Fir	43%	29%	19%	13%	9%	7%	5%	5%
Expected mortality of total stems/acre for each DBH class*	37%	23%	13%	12%	6%	4%	3%	5%

* The figures in this row reflects the weighted average for all species of total stems killed for each diameter class.

Three foot flame lengths would cause considerable damage to Habitat Type 3 young plantations but would only partially kill pole sized material. Damage to tree sizes within Habitat Types 1 and 2 is acceptable (Table 2-28). A 10-foot flame length would likely kill most of the trees under 30 inch DBH (Table 2-30).

Table 2-29. Seven-foot flame length expected mortality by species and DBH class

Species	10" DBH	14" DBH	18" DBH	22" DBH	26" DBH	30" DBH	34" DBH	35"> DBH
Douglas-fir	82%	14%	8%	5%	4%	3%	2%	2%
Incense Cedar	99%	99%	98%	62%	23%	19%	11%	5%
Ponderosa Pine	NA	NA	96%	43%	NA	NA	NA	3%
Sugar Pine	NA	99%	NA	30%	NA	NA	NA	13%
White Fir	99%	98%	85%	41%	19%	19%	7%	5%
Mortality of total stems/acre for each DBH class	94%	70%	57%	30%	12%	11%	5%	6%

Table 2-30. Ten flame length expected mortality by species and DBH class

Species	10" DBH	14" DBH	18" DBH	22" DBH	26" DBH	30" DBH	34" DBH	35"> DBH
Douglas-fir	99%	97%	95%	61%	69%	63%	41%	11%
Incense Cedar	99%	99%	98%	97%	95%	93%	89%	74%
Ponderosa Pine	NA	NA	96%	94%	NA	NA	NA	13%
Sugar Pine	NA	99%	NA	98%	NA	NA	NA	58%
White Fir	99%	99%	98%	97%	94%	93%	81%	48%
Mortality of total stems/acre for each DBH class	99%	98%	96%	84%	82%	78%	48%	41%

Effects on NSO Habitat Types 1 and 2 by various flame lengths is summarized in Table 2-42.

Table 2-31. Summary of percent tree mortality by diameter class and flame length within NSO Habitat Types 1 & 2

Flame Length Category	10" DBH	14" DBH	18" DBH	22" DBH	26" DBH	30" DBH	34" DBH	35"+ DBH	Total % of stand killed
Flame length < 4'	13%	5%	2%	<1%	<1%	<1%	<1%	<1%	20%
Flame length 4'-8'	34%	16%	3%	<1%	<1%	<1%	<1%	<1%	53%
Flame length > 8'	36%	22%	16%	8%	4%	2%	<1%	1%	89%

Note: A management assumption may be that less than a 10 percent loss within a diameter cohort is an acceptable/ desirable effect and no action would be required to reduce such mortality.

Mortality ratings based on predicted flame lengths across the LSR and the acreage of Habitat Types 1 and 2 within those areas is given in Table 2-32. Flame length projection within Habitat Types 1 and 2 is displayed in Map 2-16.

Table 2-32. Mortality ratings for the predicted flame length categories

Mortality Rating	Flame Lengths <4' Non-Lethal (20% mortality of entire stand)	Flame lengths 4'- 8' Mixed (53% mortality of entire stand)	Flame Lengths >8' Lethal (89% mortality of entire stand)	Habitat Types 1 and 2 Total Acreage
Percentage of LSR landbase	78%	21%	1%	100%

An on-the-ground, specific location analysis, found approximately 334 acres of Habitat Types 1 and 2 would likely have mixed mortality (4-8 foot flame length) and 129 acres would have a lethal mortality rating (greater than 8 foot flame length).

WATERSHED CONDITIONS

Jenny/Keene Creeks

Jenny Creek flows through a series of wide meadows and narrow canyons. The quality of habitat for fish and other aquatic organisms varies throughout these meadows and canyons. Riffles, cascades, and plunge pools dominate the canyons (Rossa 1998). Vegetation in the canyon reaches of lower Jenny Creek are relatively intact, while some of the canyons in Upper Jenny Creek have been extensively logged and roaded. The canyons up and down stream from Fredenberg meadows were not logged within the canyon walls. As a result, stream channels in the area have appropriate amounts of large woody debris (Rossa pers. com. 1998).

Almost all of the meadow areas are reservoirs or pastures. Lower Jenny Creek meadows have been extensively channelized and lack the shade, natural meander, desirable pool/riffle ratio, side channels, and suitable spawning gravels for prime fish habitat (BLM 1997). Fredenberg meadows in upper Jenny Creek has good lateral scour pools at meander bends, a diversity of meadow riparian vegetation and hiding cover under banks. However, the disappearance of beaver in the watershed is slowly changing the meadow as old beaver dams break down and are not replaced (Rossa pers. com. 1998).

The construction and operation of Hyatt, Little Hyatt, Howard Prairie, and Keene Creek reservoirs has been one of the primary human-caused factors affecting Jenny Creek fish habitat. Flushing spring or bankfull flows are shortened, reduced, or eliminated because these dams only release water in years with above normal precipitation. For example, Jenny Creek did not receive water for eight years during the droughts of the late 1980s and early 1990s. Normally, streams experience flushing

or bankfull flows every 1.5 to 2 years. Bankfull flows tumble rocks and gravels in the stream bed, effectively flushing fines out of the bed, into the water column, where they are transported downstream and redeposited in appropriate areas (Leopold 1994). An absence of bankfull flows results in the accumulation of fine sediments on and in streambed gravels resulting in a increase in rooted macrophytes and less available aquatic habitat (Knodolf et al. 1987; Knodolf and Wilcock 1996). Overall, mainstem Jenny Creek has great quantities of sediments between its cobbles and gravels and extensive beds of *Elodea* that choke slow water areas (Rossa 1998), reduce the quantity and quality of spawning gravels, winter habitat, and aquatic insect production.

Preliminary investigations indicate that lack of substrate turnover may be encouraging the production of a very aggressive grazing caddisfly, *Dicosmoecus gilivipes*, (Parker pers. com. 1998). Extremely high *Dicosmoecus* densities may be reducing the amount of food available for the algae grazing Jenny Creek Sucker.

Riparian areas in the upper half of the watershed are wider and moister than those in the lower half of the watershed and are dominated by Douglas-fir (*Psuedotsuga mensezii*), alder (*Alnus*), and willow (*Salix spp.*). Riparian areas in the lower half are narrow and dominated by willow, ponderosa pine (*Pinus ponderosa*), and Oregon ash (*Fraxinus latifolia*).

Extensive riparian logging in the 1960s, especially in the upper watershed, has limited the amount of large diameter coarse woody debris (CWD) available to many of the tributaries and therefore, mainstem Jenny Creek. The distribution of CWD (large woody material) is very clumped (Rossa 1998). In-channel and riparian areas, wood is concentrated primarily in the upstream canyon reaches that still retain large-diameter trees. In-channel debris jams are present, but not as extensive as one would expect in the lower canyon reaches. Riparian wood is rare in the lower meadow reaches because it was removed to facilitate plowing of pasture land. High water in the winter of 1997 and 1998 moved some wood into these lower canyon and meadow reaches, but overall, it will take some time for wood to become well-distributed throughout the system again.

In general, riparian condition appears to be slowly improving in the watershed. Changes in grazing strategy, recovery of previously logged riparian areas, riparian fencing, and streamside planting are all contributing factors. However, some areas continue to be heavily impacted by land use activities.

Upper Bear Creek (Emigrant/Tyler Creeks)

Below the LSR, the Talent Irrigation District's water diversion system has totally altered Tyler Creek and Emigrant Creek downstream from the Tyler Creek confluence. Diverted water from Jenny Creek has created severe down-cutting problems in Tyler Creek and has widened the Emigrant Creek channel. Very little structure remains in either channel and fish habitat is compromised (Rossa pers. com. 1998).

Emigrant Creek is also in poor condition above its confluence with Tyler Creek. Dominant substrate types are fine sediments (sand and silt) and bedrock (ODFW 1997). Hillslope failures, active bank

erosion, logging, and roads contribute fine sediments to the stream. The exposed bedrock indicates scouring and sluicing action in the channel. Riparian shading is adequate and riparian species diverse, but there are almost no trees over 20 inches in diameter in the riparian zone (ODFW 1997). As a consequence, few pieces of CWD provide channel structure, a situation that is unusual for a north-facing forested drainage. The dominant instream habitat types are rapids, cascades, and scour pools.

Riparian conditions for the Emigrant (Upper Bear) watersheds are described in the "Fisheries Habitat" section.

Camp/Dutch Oven Creeks

Only the headwaters of Camp Creek, Dutch Oven and the Right Fork of Camp Creek are in the LSR. The streams flow down on the south-facing slopes of the Klamath Ridges Ecoregion between Soda Mountain and Porcupine Mountain to Irongate Reservoir on the Klamath River in California. Stream channels in the upper reaches are steep and rocky (ODFW 1997) and in summer, much of the lower reaches go dry. Riparian areas are dominated by small diameter oaks on the hillslopes with riparian shrubs and some trees in the channel. The riparian area is generally healthy and riparian vegetation stabilizes the bank. Although only small diameter wood is present, channel structure is provided by boulders which create plunge pools. Water temperatures remain cool throughout the summer.

Riparian conditions for the and Camp Creek watersheds are described in the "Fisheries Habitat" section.

Stream Channels and Floodplains

Floodplain areas in some reaches of the Jenny Creek Watershed are heavily impacted by historic stream modification. As stream elevation has decreased, floodplain water tables have dropped significantly, reducing the extent of riparian vegetation and wetlands. Sediment is no longer regularly removed from the streambed and captured by the floodplain, and the floodplain is no longer able to absorb stream energy during high flows. Downstream aquatic ecosystems are at risk due to increased peakflows and sedimentation. Spawning and rearing habitat for resident fish is lacking in some areas. The Emigrant Creek Watershed is steep. Downcutting is not serious but some bank instability is apparent. Riparian vegetation is well established on most BLM lands.

Coarse woody debris is absent from most stream reaches. Riparian vegetation is recovering along most reaches on BLM land where cattle have been excluded, but additional protection from grazing is warranted.

Most roads in the LSR are located away from stream channels, and stream crossings are adequate for the most part.

The larger, low-gradient reaches of Jenny and Emigrant creeks have undergone significant change over the past two centuries due to the effects of fire suppression, timber harvest, ranching, open-range

grazing, and the overall increase in rural residences. These changes are discussed in detail in the Draft Box O Ranch Management Plan/EA (USDI 1997). These changes have generally lead to wider, shallower, warmer, straighter stream reaches with significantly reduced riparian area width, riparian vegetation diversity and shade. Further impacts to flood plains and water tables are discussed below. Riparian areas on smaller, higher-gradient tributaries have been impacted in a similar way; but in general, these stream channels have become more entrenched rather than wider and shallower.

Water Quantity

Intermittent streams account for most of the stream miles within the LSR, although the largest streams tend to be perennial¹. A majority of the perennial streams are also fisheries streams. Most streams in the LSR have increased peak flows during storm events, due largely to dramatic increases in road density within the past 40 years. Open canopy areas created by timber harvest within transient snow zone areas have also contributed to the flashiness of some streams, although not to the same extent as roads. Summer low flows have decreased in many of the larger streams due to irrigation and hydroelectric diversions, with significant impacts seen in Jenny, Keene, Grizzly, Soda, Corral, and Spring creeks. Other streams have significant increases in summer flows (though erratic and often having lower water quality) due to augmentation by the same sources; these include Fall, Tyler, and Emigrant creeks. Streams relatively unaffected by large flow augmentations or diversions include Mill, Lincoln, Dutch Oven, upper Camp, Green Mountain, Porcupine, and Baldy Creeks.

Jenny Creek is the largest of the streams within the LSR. Peak flows on Jenny Creek at the north end of the Box O Ranch have been calculated for various recurrence intervals using USGS flood frequency equations. These analyses indicate a range of flow for an event with a two-year return interval between 1,873 and 4,549 cubic feet per second (cfs), and for a 100-year return interval between 5,033 and 16,968 cfs. An additional set of peakflow estimations was done with the assumption that areas above Howard Prairie and Keene Creek dams were not contributing to downstream flow conditions, indicating a range of flows in a two-year event between 1,361 and 3,395 cfs and between 3,827 and 12,528 cfs in a 100-year event.

Howard Prairie, Hyatt, and Keene Creek reservoirs are managed primarily for irrigation in the Bear Creek Watershed to the west, with some hydroelectric production and recreational opportunities provided as a result. The reservoirs are not managed for purposes of flood control. As a result, the reservoirs may reach full pool early in the water year, especially in years with above normal precipitation and/or in series of years with precipitation surpluses. When this occurs, surplus water goes over the spillways of the dams, resulting in downstream flows representative of pre-dam conditions.

¹ On-the-ground stream inventory, scheduled for 1999-2000, will identify the specific type and location of all streams and other hydrologic features within the LSR, a requirement to determine riparian reserve requirements outlined in the Northwest Forest Plan.

During major storm events, transport ditches may be diverted back into streams to prevent ditch failures caused by overflow from overland flow intercepted by the ditches. The net effect is potential peakflow nearly identical to that which occurred prior to construction of the dams. This situation occurred in January 1997, as a major flow event occurred at a time when the reservoirs were already at full pool. Peakflows may be even higher than natural conditions, due to direct interception of precipitation by the reservoir surfaces (instant delivery of precipitation into the stream system), increased efficiency in the drainage patterns in the watershed due to concentration of flow by roads, decreased canopy closure and increased transient snow zone openings from timber harvest and other land uses. Some of these impacts may be offset by the effects of fire suppression over the past century. There may have been significant canopy openings maintained by wildfire in prehistoric times that have now grown over. There is some indication that peakflows are still lower than natural conditions (Parker, pers. comm. 1998). Fortunately, flows can now be measured because a USGS stream flow gage was installed in Jenny Creek during the summer of 1998. In summary, winter baseflow in Jenny Creek has been below natural condition in most years. Normal baseflow only occurs when the reservoirs are full and the transport system over the mountains is shut down.

The Oregon Department of Fish and Wildlife (ODFW) filed an Instream Water Right application to maintain specified minimum instream flows in Jenny Creek from the mouth of Johnson Creek downstream to the mouth of Keene Creek. Necessary minimum flows needed range from 4 cfs in September to 16 cfs in March through May. Identified uses are: fish migration, spawning, egg incubation, fry emergence, and juvenile and adult rearing.

Water quantity data gaps identified are as follows. The impact of water right allocation on streamflow has not been analyzed. Water rights information for the LSR needs to be acquired from State Water Resources. Information from a 1989 inquiry suggests that water rights may allocate over 300 cfs from the Jenny Creek watershed alone, or more than 20 times the typical summer flow observed in recent years. Mean daily, monthly, and annual flow has not been calculated for streams within the LSR. This task is difficult due to a lack of gaging stations on comparable streams in the region.

Annual flow patterns in many streams are characterized by extreme levels with flood events in winter and spring months, and low flows, or dry channels in summer and fall months. Floods are responsible for deposition of sediment on floodplains, introducing coarse woody debris to the stream channels, and establishing natural meander with pools and riffles. Fish and macroinvertebrates are lost in these events and riparian vegetation is often destroyed.

Low summer flows and high water temperatures are most often linked together and usually result in impacts to aquatic organisms. As stream flows are reduced and temperature rises, competition for space and food increases. The metabolism rate in fish increases, therefore, the demand for food is greater. There is a greater risk of disease and predation.

Roading and clearcuts in transitory snow zones can contribute to accelerated snow melt and runoff during winter storms. This situation adds to both flood events and a depleted water supply for

summer streamflows. It is anticipated that this may continue to be a problem on private lands. Future management of federal lands should help alleviate the current situation.

High winter and spring flows contribute to the water table and bank storage but the potential for bank storage is lessened, however, when stream channels become too incised to allow bank storage.

Jenny Creek is a water-poor stream due to diversion of water from the basin by Talent Irrigation District (TID) and use of instream flows for irrigation within the basin. (TID diverts an estimated thirty percent of the annual runoff in the basin.)

Water Quality

Stream temperature in the LSR has generally been negatively affected by changes in channel structure, flow modification, and streamside vegetation quality. Stream temperature data has been monitored at numerous locations within the LSR. Fahrenheit 7-day average maximum temperatures typically range in the mid-70s to mid-80s for most sections of Jenny Creek; low 70s to near 80 for Corral and Beaver creeks; upper 60s to upper 70s for Tyler Creek; mid-60s to near 80 for Emigrant Creek; mid to upper 60s for Baldy, Keene, and Grizzly creeks; and low 60s for Soda and Dutch Oven creeks. Stream temperatures on the majority of mainstem creeks currently exceed State water quality standards. Temperatures measured at springs in the LSR tend to fall in the mid-40s to mid-50s.

Turbidity data has been collected for a number of locations in the Jenny Creek area; the resulting observations probably apply to the other areas as well. Measured turbidities during major storm events tend to be lower than in many locations in southwest Oregon. Movement of sediment and dissolved minerals tend to be the primary sources of turbidity during the winter months; summertime turbidities tend to be related more to organics in the water. Summer turbidity levels have probably increased over time in response to increased algal growth attributable to channel widening and increased stream temperatures. Winter turbidities also have likely increased, due to sediment delivery from roads, increased sediment load in streams due to channel simplification, and bank erosion due to channel modification and increased peak flows. Occasional landslides into the stream system input the largest quantity of sediment by far.

One hundred and thirty measurements of pH at 19 stream sites in the LSR yielded results between pH 6.0-8.5, with 94 percent of those between 7.0 and 8.5. These levels are "normal" for forested streams and within the range ideal for fish (Nelson et al.1991).

Although not assessed, other water quality parameters probably suffer from some of the same impacts discussed above. For example, dissolved oxygen probably drops to less-than-desirable levels in some streams during periods of low flow and warm temperatures. Dissolved oxygen levels are negatively impacted by reduced summer flow, reduced channel complexity, and increased water temperature.

Current management prescriptions, as outlined in the RMP/ROD, are appropriate for maintaining or improving water quality on BLM lands. Management practices on private lands or water diversions

from the Jenny Creek Watershed are beyond BLM control. Timber harvesting on private lands and grazing practices may result in accelerated winter runoff, increased turbidity and sediment, and impaired riparian habitat.

RANGE (LIVESTOCK) MANAGEMENT

Livestock grazing was one of the first uses of this area by settlers after they began occupying southwestern Oregon in the late 1850s, and has influenced BLM's management of its lands. This section discusses the grazing program as it exists today. It should be noted that this LSRA is designed for the management of forested sites. Although included in the original proposed LSR boundary, there are large areas of rangeland that have no potential as LSOG forest habitat. Management of these non-forested areas would continue under the guidance contained in the Grazing EIS and RMP/ROD.

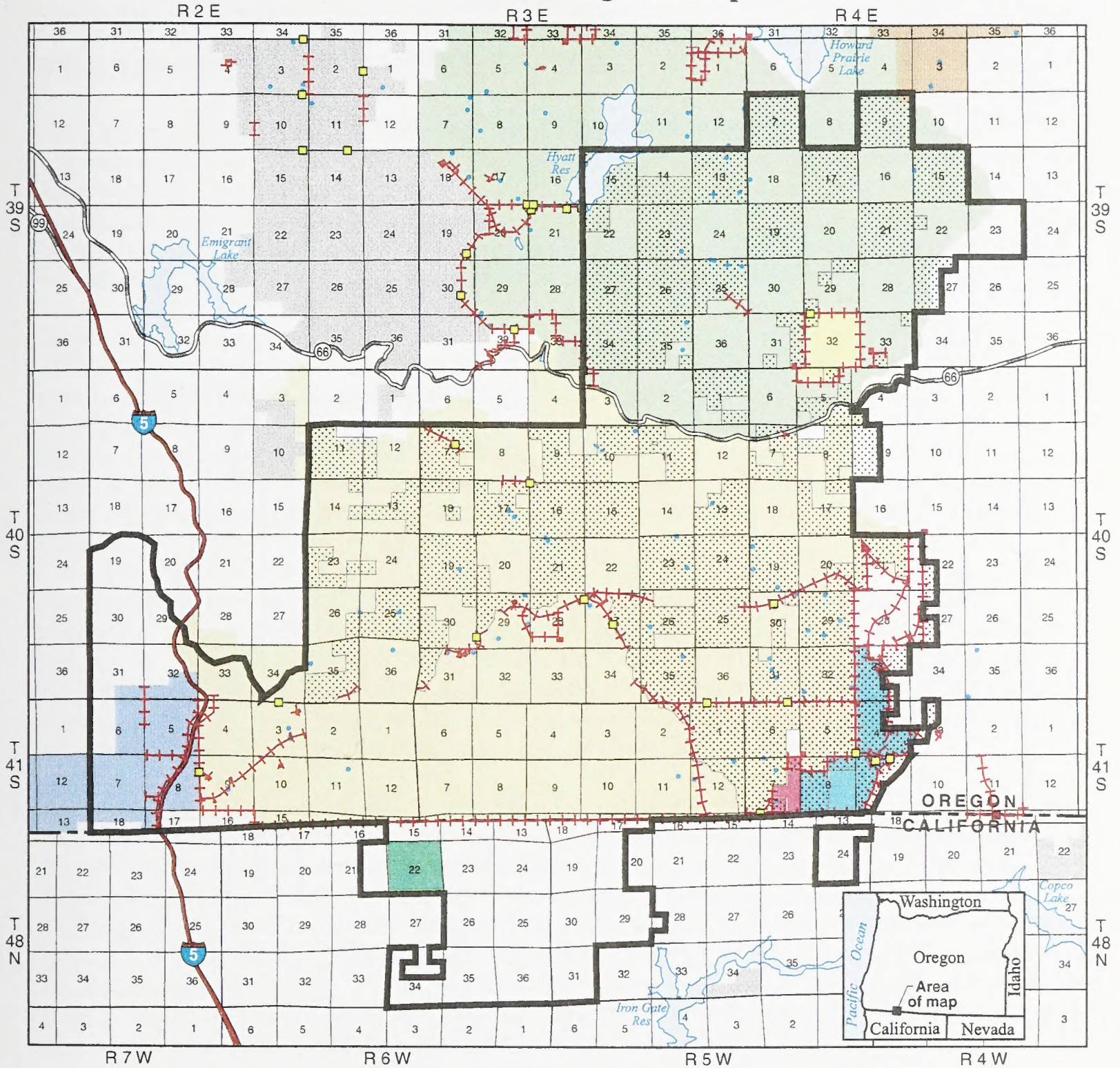
Conflicts with homeowners regarding livestock grazing occur primarily in or adjacent to livestock herd districts. A herd district formed in 1974 is found adjacent to the Jenny Creek LSR. Other conflicts between people and livestock occur around Howard Prairie Reservoir and Hyatt Lake campgrounds. In the past some complaints were received along the Greensprings area; some local complaints still occur in this area, especially during drought years when cattle are seeking green forage.

Riparian areas are unique and among the most productive and important ecosystems. Healthy riparian systems display a great diversity of plant and wildlife species, purify water, and dissipate stream energy. Riparian areas are also focal points for recreation and livestock.

Livestock may tend to seek out riparian areas during hot weather, seeking water, shade, and green forage. This tendency to concentrate in riparian areas in conjunction with the protein content of some browse species may result in riparian vegetation removal along streams and around wetlands. Implementation of sound livestock management and best management practices (salt locations, herding, alternative water sources, fencing, seeding, etc.) has greatly decreased or eliminated livestock concentration in riparian areas.

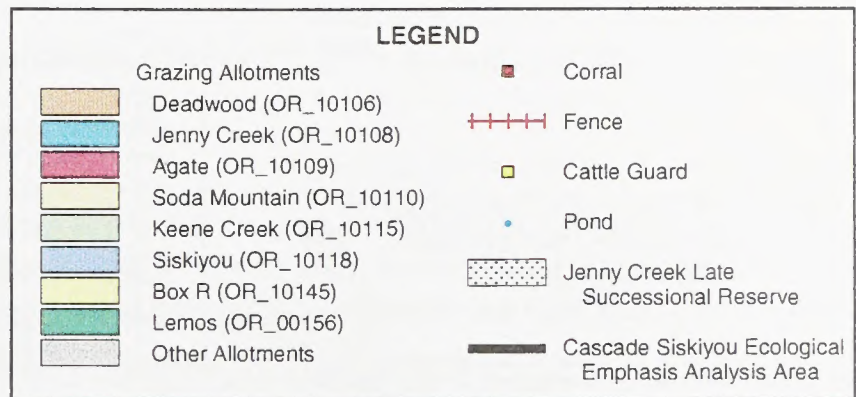
Springs and seeps provide water for livestock and wildlife and may also provide habitat for disjunct populations of mollusks. Conduct surveys on more than twenty springs in the LSR to determine the presence or absence of Survey & Manage species of mollusks. Protective measures (i.e. pole fencing) may be necessary to protect some cold water sites where mollusk populations are discovered. See Map 2-17 for grazing allotment locations. A more detailed discussion of each grazing allotment within the Jenny Creek LSR can be found in Appendix L.

Jenny Creek Late Successional Reserve Grazing Allotments and Rangeland Improvements



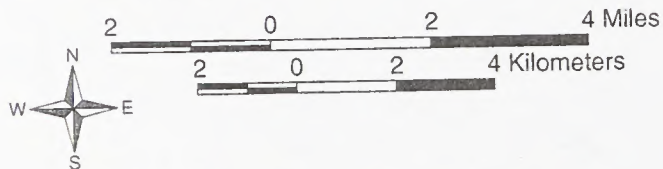
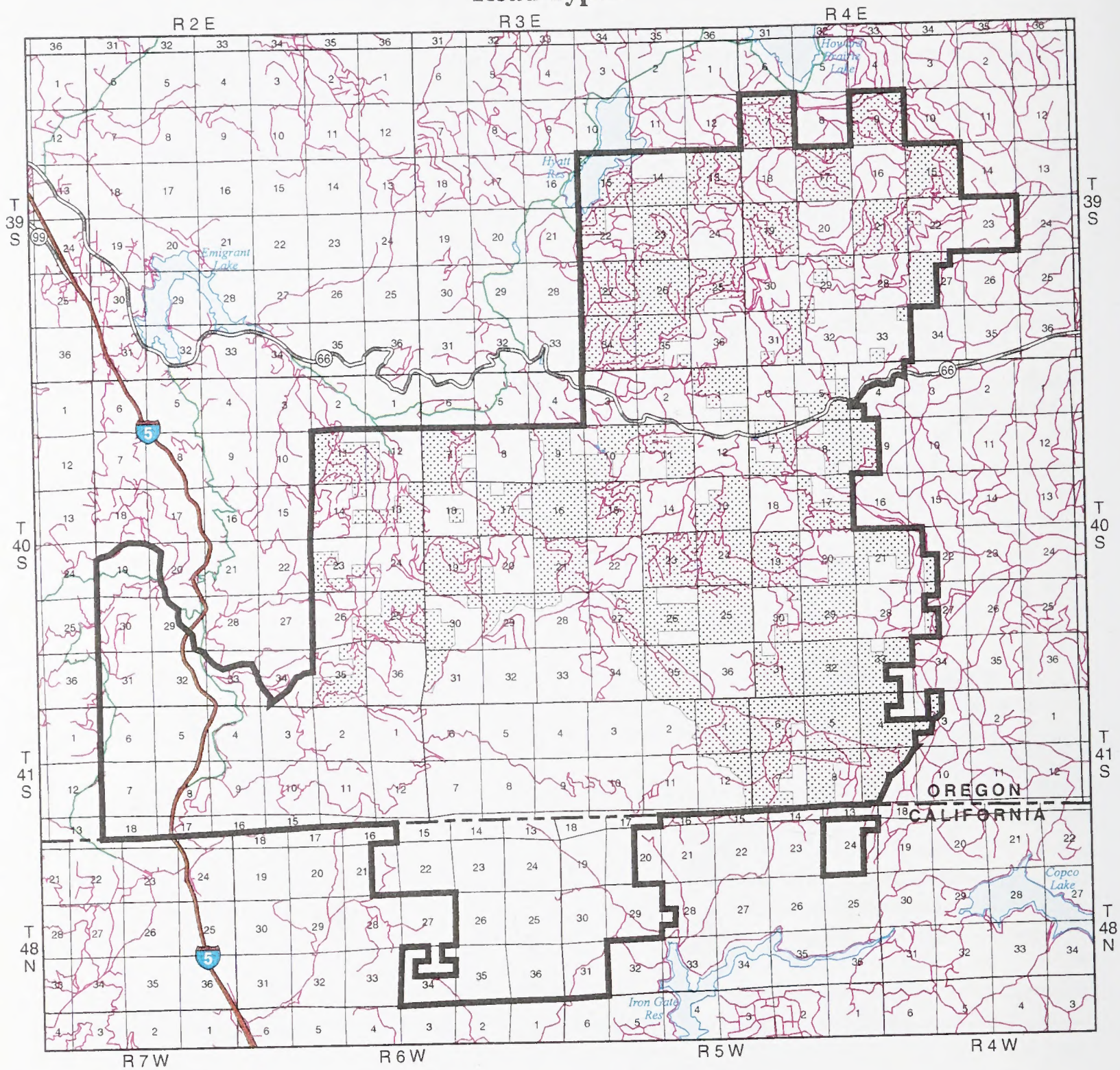
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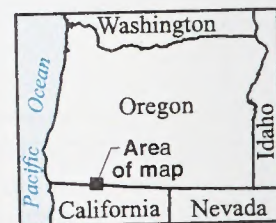
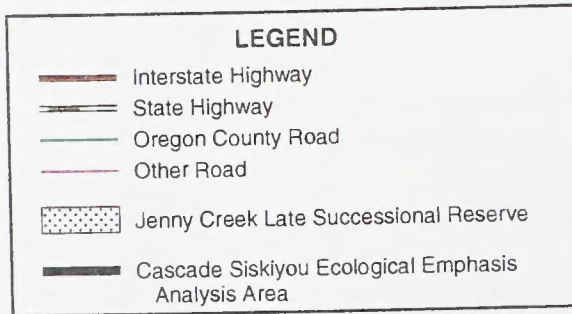
MAP 2-17

Jenny Creek Late Successional Reserve Road Types



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MAP 2-18

D03-02-00:JR

TRANSPORTATION SYSTEM

Early settlers built wagon roads in the watershed beginning in the mid-1800s to provide transportation routes for early settlers. Later roads were constructed for sheep and cattle ranchers. Eventually, a road system was developed for various recreational activities, homesteads, logging, fire access, and other land uses. Today, roads are owned or managed by the BLM, various companies, the State of Oregon, Jackson County, and many private landowners. Road conditions in the watershed vary from primitive four-wheel drive roads to paved major state highways, such as Highway 66.

BLM's Geographical Information System (GIS) and Transportation Information Management System (TIMS) identifies approximately 109 miles of BLM road within the LSR (Map 2-18). BLM-controlled roads consist of approximately 40 miles of natural surface roads, 75 miles of rocked roads, and 4 miles of bituminous surface treatment (BST) roads. The remaining miles of road are either private, county, state, or jeep roads on BLM lands. BLM roads are maintained for log hauling and administrative purposes. BLM's inventory contains very little information about non-BLM controlled roads. Most county roads have a bituminous surface. Private roads are usually left unsurfaced or are rocked.

Approximately 95% of the BLM land in the LSR is currently under reciprocal right-of-way agreements. These lands are subject to having roads built across them by the permittees to access their lands. The BLM has limited discretion to refuse a reasonable request to construct a road on lands included in the reciprocal agreement. However, over the years the permittees have constructed most roads that they need for access. In some areas permittees are closing roads to their lands. It is anticipated that very few roads will be constructed in the future.

All BLM-controlled roads have a maintenance level assigned to them. BLM monitors and modifies the maintenance levels when needs and conditions change. Maintenance levels range from low to high standards depending on the objective for each road. Sharing and maintaining roads with landowners has also reduced road density and maintenance costs. Fees charged for commercial use of BLM-controlled roads partially fund BLM road maintenance. However, a reduction in timber harvest levels has resulted in a significant decrease in the primary funding source for maintaining the BLM transportation system. The BLM is no longer maintaining roads at their historically maintained levels. Some roads have been or will be decommissioned to reduce maintenance requirements and erosion potential. Other roads are closed until future access is needed, while some roads are maintained at the lowest possible level. See Map 2-19 for road locations and closure status.

BLM roads are generally open for public use unless blocked by gates or other methods. Gates and other road barriers regulate vehicle access to reduce maintenance costs, soil erosion, wildlife disturbance, and the transfer of noxious weeds.

The BLM sometimes grants legal authorization for use of roads to individuals who need long-term authorization for a specific need. BLM authorizes this type of right by means of a right-of-way grant. Some roads in the analysis area have reciprocal road use agreements between the BLM and timber

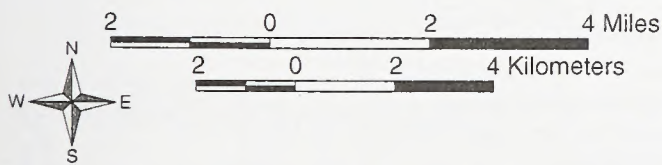
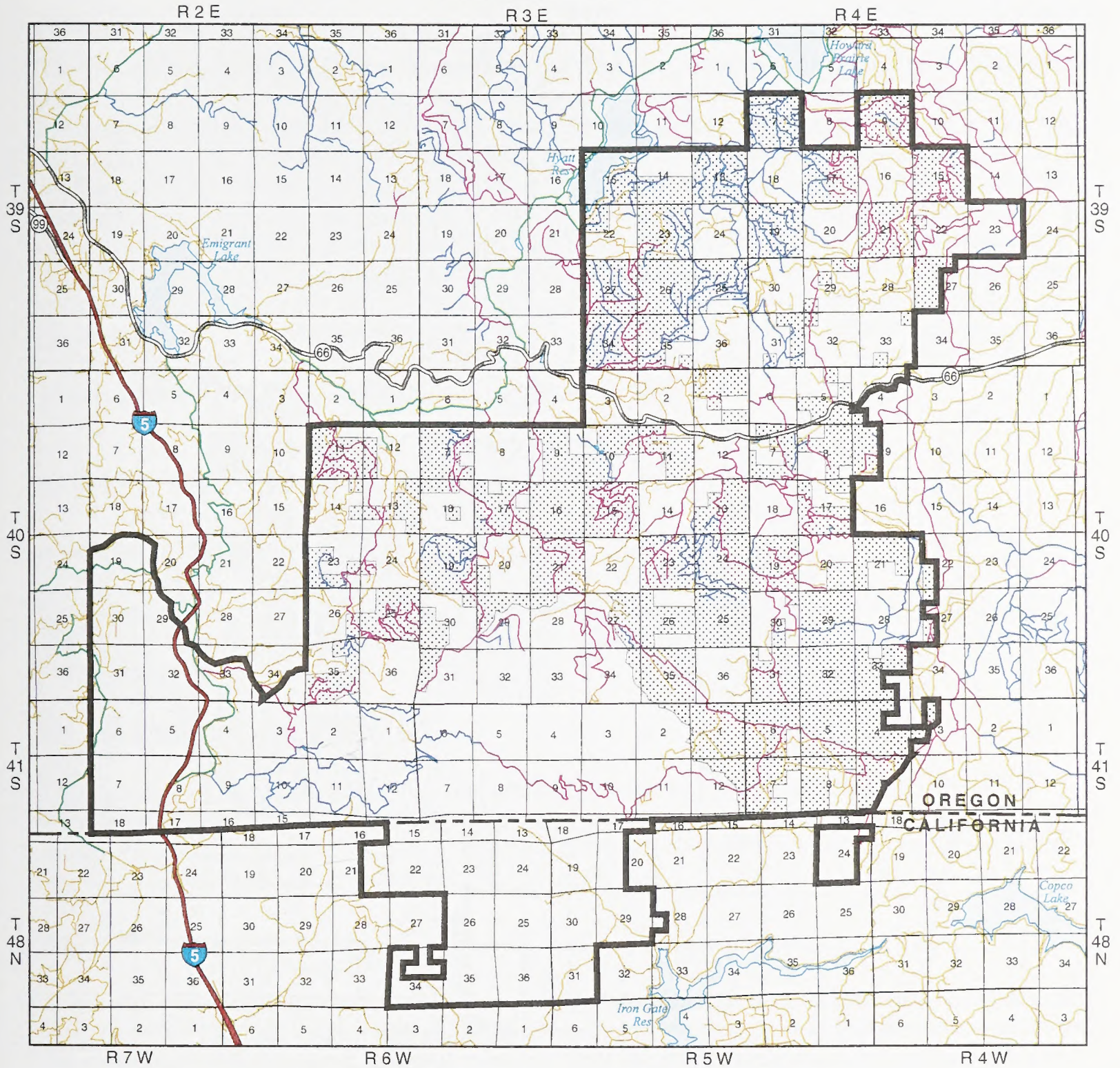
companies providing for a shared cost and use of specified roads (Map 2-20). The BLM obtains easements for access across private properties.

Providing high quality, functional, connected, LSOG habitat for a variety of species is one of the stated LSR objectives.

Roads may be detrimental to the quality of LSOG habitat for several reasons and may need to be modified or removed:

1. Roads fragment the habitat and disrupt connectivity between forest habitats. This is especially true for low mobility species such as slugs, snails, and small mammals.
2. Roads facilitate human access and disturbance to wildlife. This disturbance ranges from noise disturbance of nesting birds, to poaching of game and shooting of non-game species, to accidental road kill deaths. There have been several documented instances of spotted and great gray owls being killed by automobiles on BLM roads and on surrounding national forests. Small mammals are also susceptible to being killed on roads.
3. Roads facilitate access into forested areas by livestock and noxious weed species.
4. Roads are ecological edges. Edges can attract predators and Brown-headed Cowbirds which are nest parasites on other bird species, some of which are LSOG associates. Edges also change habitat parameters within adjacent forest stands such as humidity, wind speed, light penetration etc.
5. Snags are essential elements of LSOG forest. Snags along roads are often identified as hazard trees and scheduled for removal. The more roads in an area, the more snags become potential hazards trees due to their proximity to roads.
6. Roads provide access for illegal fuel wood cutters. This results in a loss of snags and CWD.
7. Roads provide access for humans which could result in human caused wildfire starts (accidental and intentional).
8. For a complete list of species associated with LSOG habitat and intended to benefit from LSR's. Most of the species listed there could be negatively effected to varying degrees by roads in the LSR.
9. Jenny Creek watershed was designed a Key Tier 1 watershed under the NFP. The management direction calls for reduced road densities in such watersheds in order to facilitate recovery of watershed function and aquatic biodiversity.

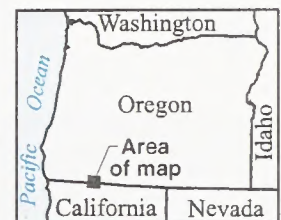
Jenny Creek Late Successional Reserve Road Closure Status



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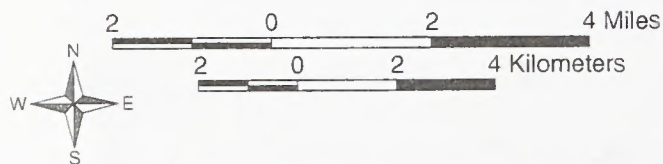
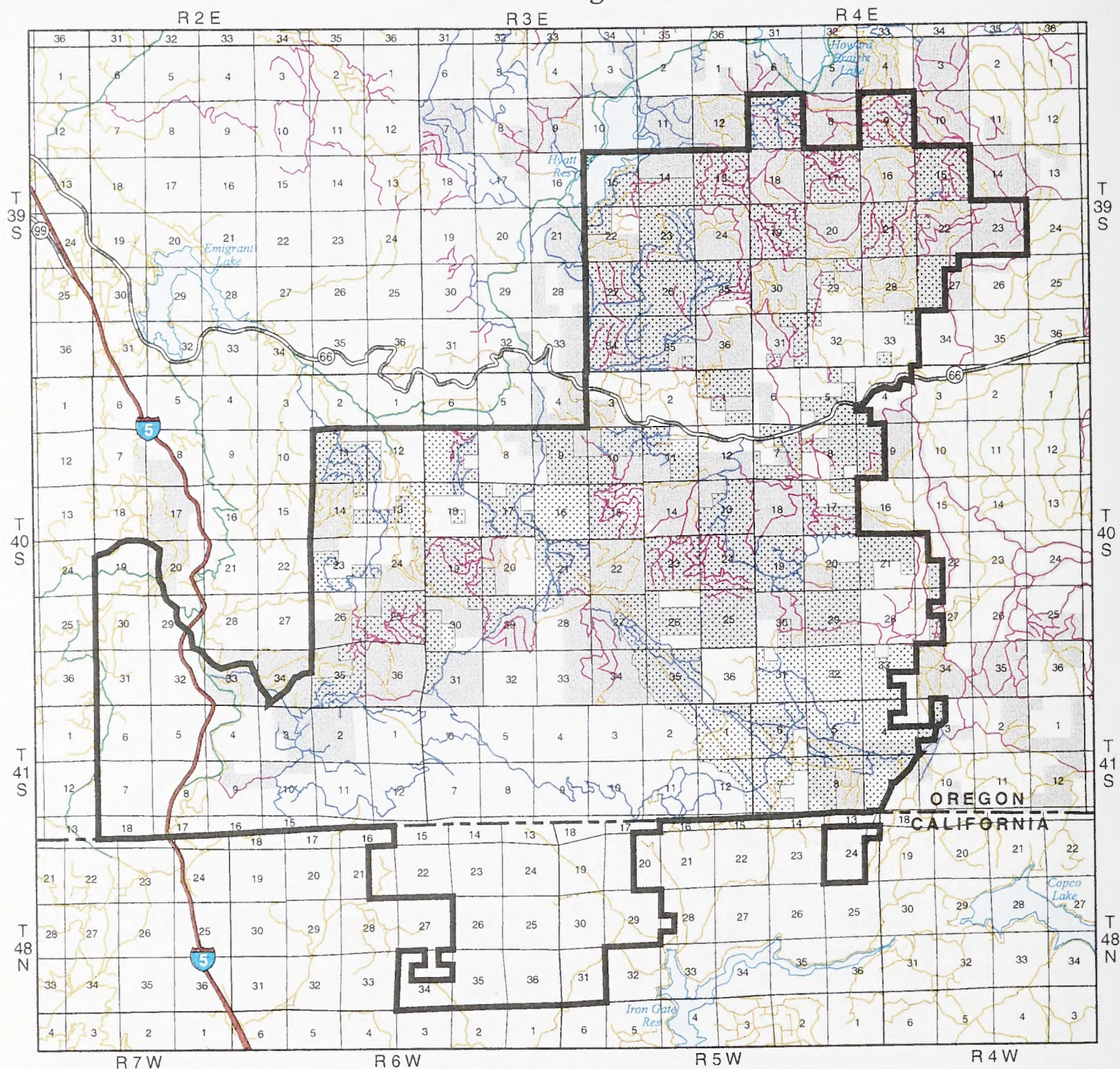
LEGEND	
	Interstate Highway (public access)
	State Highway (public access)
	Oregon County Road (public access)
	Open BLM Road
	Closed BLM Road (seasonal and permanent)
	Closed Road, Private or Non-Inventoried
	Jenny Creek Late Successional Reserve
	Cascade Siskiyou Ecological Emphasis Analysis Area



MAP 2-19

D03-02-00:JR

Jenny Creek Late Successional Reserve Access Rights

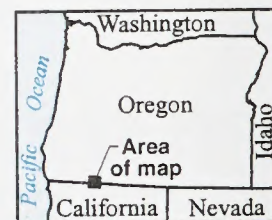


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LEGEND

- Interstate Highway (public access)
- State Highway (public access)
- Oregon County Road (public access)
- Public Access Road
- BLM Access Road
- Private or Non-Inventoried Road
- Reciprocal Right-of-Way Agreement
- Jenny Creek Late Successional Reserve
- Cascade Siskiyou Ecological Emphasis Analysis Area



MAP 2-20

D03-02-00:JR

The BLM has improved drainage by increasing the frequency of water dips and culverts, sized stream culverts to the 100 year flood discharge, and decommissioned several low use roads. Road inventories are being conducted to identify potential road management problems and opportunities for correcting these problems. The average road density on BLM land is approximately 3.5 miles per section. This is below the desired threshold road density for soil and water (4 mi./sec.) but may be above the desired road density for terrestrial wildlife (2.5 mi./sec). As a result, the LSRA team completed a road objective analysis and map identifying approximately 40 miles of potential road closures for future planning purposes. This figure is based on a preliminary analysis and it should be anticipated that changes would occur over time as on-the-ground analysis provides information about the best type and location for specific road blocks. Most of these roads are natural surfaced spur roads and would be closed with gates, barricades or other semi-permanent barriers. The road planning map is on file with Ashland Resource Area Engineer.

OTHER MULTIPLE-USE ACTIVITIES

Fuelwood Gathering

Fuel wood gathering is permitted only in existing cull decks, where green trees are marked by silviculturists to thin (consistent with this LSRA), and to remove blowdown blocking roads within the road prism.

Developments

Development of recreational facilities will be conformance with the Hyatt and Howard Prairie Reservoir Management Plans. No LSOG habitat is projected to be affected. Routine maintenance of existing facilities continues. Current developments include campgrounds, recreational residences, cross-country ski areas, utility corridors and electronic sites.

Special Forest Products

Demand for special forest products (mushroom collection, Christmas trees, mistletoe collection, etc) is increasing. This has led to a concern for the sustainable harvest levels of these products along with the protection of the resource. There is relatively little information regarding the amount of harvest of some of these species which is occurring with the LSR.

Dispersed Recreation

Dispersed recreation uses, including hunting, fishing, and hiking, are a normal use of the Jenny Creek LSR. Off-Highway Vehicles (OHV) have regularly used most of the roads and trails within the LSR. Education, use limitations, traffic control devices are being evaluated, especially if these practices retard or prevent attainment of LSR objectives.

Research

A variety of wildlife and other research has been proposed within the LSR. Most of the research is proposed outside the current or potential LSOG habitat. Activities within current or potential LSOG forest habitat will only be considered if there are no equivalent opportunities outside the LSR.

Land Exchanges

Land exchanges are considered if they provide benefits equal to or better than current conditions and there is a willing seller. In Jenny Creek public and private lands are intermingled (checkerboard ownership) and land exchanges could improve connectivity of habitat area, distribution, and quality (shape and biodiversity).

Other Activities

Other activities are evaluated by local interdisciplinary teams. If the activity has potential adverse effects on LSR objectives they are subject to Regional Ecosystem Office review.

CHAPTER 3 DESIRED CONDITIONS

DESIRED PRACTICES AND PROCESSES

The desired condition within the Jenny Creek LSR is to provide LSOG habitat in which structure and composition is consistent with the site conditions and ecological processes, and maintain biological diversity associated with native species and ecosystems. Important LSOG structural attributes include live old growth trees, standing dead trees, fallen trees, logs in streams, multiple canopy layers, canopy gaps and patchy understory vegetation. These conditions can begin to appear when forest stands are between 80 and 150 years in age, depending on site conditions, species composition, and site history.

The generalized desired condition is to promote and maintain LSOG conditions in the maximum amounts sustainable through time. Differences in LSOG structure and process exist between forest community ecotypes within the LSR and no single desired condition is appropriate for the entire landscape. It is desirable to have amounts of LSOG habitats which are at or beyond the high end of the identified sustainable levels. The sustainable levels are based on a realistic look and analysis of the many factors that influence LSR vegetation over time.

Processes that create LSOG forests and biological diversity of native species move through various stages that may span decades to several hundred years. Plant community dynamics in non-forest (grassland, shrublands and most woodland) communities are characterized by large changes in species abundance over short periods of time due to short life spans and relative frequent disturbance by fire. Forest dynamics may span several hundred years and are characterized by tree growth and maturation, death and decay of large trees, low to moderate intensity disturbance (wildfire, wind, insects and diseases) that create canopy openings and gaps in various strata of vegetation.

It is desirable to have variability in vegetation characteristics. It is neither desirable nor possible to have entire landscapes in LSOG habitat or the same vegetation characteristic, stocking levels, tree sizes or understory components. Within each vegetation community the desired condition will vary in accordance with site capability, which is influenced by elevation, slope, aspect, soil conditions, and climatic influences. Forests will be found at higher elevations, more mesic north and east aspects, and grassland to woodlands will generally be found on south and west aspects and will generally have open conditions and often “pioneer” species. Canopy closure will vary across the landscape, generally tending towards more open on lower elevation and south and west slopes to more closed on higher elevation and north and east aspects.

The re-introduction of fire into the LSR will help encourage the processes and attributes that define more historic vegetation communities and LSOG forest conditions. It is desirable to have low to moderate intensity fires burn in the LSR. Low intensity fires can reduce fine fuels and ladder fuels,

create a seedbed for a diversity of herbaceous plants and create a patchy understory open to various plants and wildlife. Moderate intensity fires are desirable if they create small openings in the canopy of about five areas or less. This allows for ingrowth of tree seedlings and other early successional plants, and creates snag patches and concentration of down woody debris that are important prey base habitats. Burn openings are most desirable if they occupy a small percentage (5-10%) of the stands providing habitat.

Large, stand replacing, high intensity fires are not desirable within the LSR. The introduction of a fire cycle more similar to that which occurred in pre-suppression time will reduce the risk of catastrophic fires. Variability of fuel conditions across the landscape is desired with some high concentration of fuel intermixed with low fuel accumulations. South and west tending aspects and upper slope positions which are typically drier and harsher will generally contain light fuel loading. Site capability will influence fuel loading. Rare plant community too will require special habitat treatments considerations.

It is desirable to keep insects and related mortality at levels more closely associated with historic levels with occasional spikes during drought periods.

It is desirable to provide habitat which contributes towards the recovery of the NSO. Forest lands within the LSR, including the known NSO activity centers, will be managed based on NSO habitat types. Reintroduction of fire into the LSR may reduce the occurrence of habitat components locally. This is a trade-off in order to create less hazardous fuel conditions that would otherwise put large areas of habitat at risk.

In the Jenny Creek LSR the more structurally complex late seral stage conditions generally occur on higher elevations on north and east facing slopes in the Mixed Conifer and White Fir Plant Communities. The following is a description of desired conditions for the LSR using specific stand and habitat characteristics. NSO habitat type and site capabilities are influences that drive the following desired condition statements.

SPECIAL VALUES

Biodiversity

Desired Condition

Biological diversity associated with native plants and ecosystems should be maintained and restored as needed. Efforts should be made to restore the LSR to its former rich mosaic of many different habitat types with borders and edges that reflect natural breaks caused by topography, watersheds, soils, geology, and native plant communities. Small or unusual natural communities must be protected to maintain diverse habitats that will support a maximum number of healthy fungal, plant, and animal species.

Connectivity

Desired Condition

Because of topography, the pattern of current and potential LSOG habitat, and land ownership pattern, the area in the northwestern portion of the LSR is key to wildlife connectivity across the landscape between Southern Oregon Cascades and the Siskiyou (Klamath) Mountains of Oregon and California. Emphasis should be on protection of both NRF and dispersal habitat of a corridor approximately three miles in width. This corridor may shift north and south as more habitat is restored in future decades.

Another connectivity corridor between the Oregon and California Cascades should be developed as dispersal habitat is restored. This route should not restrict protection and restoration treatments except to maintain dispersal conditions in the short term and develop long term NSO suitable connectivity habitat in later decades.

The connectivity corridor zone habitat must be protected and maintained in a condition that animals will use for movement from one area to another for food, breeding, or migration. Private lands in the LSR should be considered for acquisition, conservation easements, and/or cooperative management agreements to provide dispersal habitat for uninterrupted passage by native plants and animals.

VEGETATIVE HABITAT

Plant Communities

The lands included in the Jenny Creek LSR support a rich array of vegetation types beyond the functional LSOG coniferous forest ecosystems designated in the NFP/ROD Standards and Guidelines for the management of habitat for LSOG associated species within the range of the NSO. None of the ecosystems represented in LSR function independently; the health of all included ecosystems in the four ecoregions depends on the health of the whole. They play important roles in hydrology, soil formation, plant and animal migration, maintenance of biodiversity for plant and animal evolution, and sources of species to cope with long-term climatic trends. Ideal future conditions may be impossible to attain with or without human intervention and land use practices (see Figures 4-1 and 4-2 plant community change state and transition diagrams of Chapter 4).

Grasslands, Shrublands and Woodlands

Unlike conifer communities, grasslands, shrublands, and most woodland plant communities are characterized by large changes in species abundance over short periods of time. This is because many plant species have short life spans, and are dependent on fire for reproduction.

Various herbaceous species thrive for only a few years before conditions change enough to prevent growth. Shrub species may grow decadent after a few decades, and need to be renewed through activation of their seed bank or resprouting by fire. Furthermore, many hardwood species are dependent on fire for creating conditions favoring their persistence on the landscape. This condition is described in terms of fuel-loading. Presently, fire suppression has lead to high fuel conditions conducive to intense fires with the ability to kill the above-ground hardwood component, as well as latent, below-ground epicormic buds.

A generalized 'desired future condition' incorporates a reduction of fuel-loading over the landscape, while also recreating a range of conditions (relating to plant life-form composition and fuels) across the landscape.

Patterns of Plant Community Change

The identification of patterns of plant community change provides models on which to base stand condition. With a knowledge of how management can interact with trajectories of plant community change within stands, the larger landscape matrix (within which stands are embedded) can be guided towards a desired future condition. This implies that stand level conditions (for example, low, intermediate, or, high shrub canopy conditions of a particular plant community) as well as landscape level criteria (such as connectivity and interspersation of conifer stand conditions) can be managed within a defined landscape. Of course, this is only feasible if managers understand past and present interaction of forces [ecosystem process (e.g., fire and pathogen outbreak), management, and function (e.g., soil and nutrient cycling)] with individual species (herbaceous, shrub and tree) and plant communities across the landscape.

State and transition diagrams can be used to depict changes within distinct plant communities across the landscape. Such models also provide a way to show how ecosystem process, functioning, and management can interact to result in changes from one plant community state to another. Different states may have varied value to wildlife, and provide a range of habitat for listed plants, fungi, lichens and other organisms. The state and transition models thus provide a schema for defining the range of values across the landscape. With a baseline inventory of plant communities, mapping in GIS can quantify and create spatial monitoring maps of plant communities and species of interest.

Grasslands

Although there are some areas of intact native grasses, much of the area is presently occupied by alien annual grasses and forbs. This has come about primarily from mechanical disturbance, the distribution of weeds by humans and their agents, and the cessation of fire.

Desired Condition

Maintain intact native grasslands and restore those annual grasslands that are reasonable to restore. Prevent the spread of weeds by changing livestock management practices in sensitive areas and road and trail closure. In areas where annual grasses are extensive and well

established manage them as an annual grassland ecosystem. (The time and energy spent in attempting to restore such areas might be better spent on remaining native grasslands.) Use prescribed fire as a method to both maintain intact native grasslands and as appropriate to control weed species.

Shrublands

Shrublands are generally short-lived, and complete their life cycle in a few decades. While decadent shrublands still provide shelter for wildlife, their value as a source of browse diminishes with time.

Desired Condition

Maintain a range of conditions on the landscape subscribing to the varied needs of the local wildlife. Prescribed fire is the preferred management tool.

Oak Woodlands

Oak woodlands play an important role for wildlife, providing acorn mast for food for many bird and mammal species and as nesting sites for several birds, including Western Bluebirds and Lewis Woodpeckers among others. Native ungulates, other mammals, and birds utilize shrubs and grasses for forage.

Desired Condition

Maintain a range of oak woodland conditions across the landscape. High canopy oak woodlands have increased in abundance across the landscape. A return of a portion of LSR high canopy oak woodlands to widely spaced old savanna-form oaks with large isolated ponderosa pines and extensive grass and shrublands will be difficult, perhaps impossible to attain without the continuous use of fire for a long period of time.

Where high canopy oak woodlands need density reduction, initial treatment might include regular light fire or hand removal of most of the forest-form oaks that have grown up in the years since effective fire suppression (100 or more years ago). Prescribed fire could play the same critical role in the restoration of oak woodland understory as with grasslands.

Mechanical treatment invites the spread and establishment of alien weeds by providing disturbed habitat.

Ponderosa Pine Dominated Forest Stands

These stands will have relatively open canopy (10-50% crown closure) and are mostly forest lands not capable of growing dense mixed conifer stands (FOI Site Classes 5 and 6). Most of these stands are dominated by shrubs and oaks. Overstory conifers will be ponderosa pine and Douglas-fir on 10% to 50% of the landbase. Conifers will be scattered or confined to small groups on these sites with conifers generally ranging from 5 to 20 trees per acre. Snag levels will generally average 2+ per

acre and down woody debris will also average 2+ trees per acre. Fuel conditions should be such that average flame length will be 4 feet or less.

Some of these stands will be structurally diverse as they occur on sites not capable of providing NSO Habitat Types 1 and 2.

Desired Condition

For desired future forest tree condition for the general forest LSOG community for pine domination see Tables 3-1 below and Table 2-6.

Mixed Conifer Zone/White Fir Series

Future mixed conifer forests should be self replicating, uneven aged stands with snags, coarse woody debris, and canopy gaps. The present level of shrub and herb diversity should be maintained. A healthy environment for forest fungi is equally important. The risk of mixed conifer forests becoming white fir dominated forests should be minimized through the careful use of fire.

The understory stocking levels of white fir in white fir or mixed conifer series and dense stands of mid-seral size white fir will show declines in stocking levels with reintroduction of fire and stand density management measures, while other conifer species will increase in occurrence. Large old-growth trees, particularly ponderosa pine, sugar pine, and Douglas-fir will have reduced competition from competing white fir that are growing and competing in the understory. Ladder fuels will be reduced as well. These large cohorts should thrive and continue to be a major part of stand composition. Forest gaps will be filled by pine species, resulting in a shift to more mixed species composition and an uneven aged character with white fir again being reduced as a stand component overall. This will be less evident in high elevation white fir series where white fir will continue to be the major stand component. At the same time, some stands would continue to exhibit overstocked character, but there would be less of this type of stand particularly where overly dense stocking would be detrimental to preferred wildlife habitat and/or old-growth development. While stocking density will decline overall in mid-seral and mature forest stands, canopy should not. It will be distributed over fewer larger trees that would be expected to grow from an average of 16" dbh to 24" dbh over 20 years with density stocking reductions, for example.

Forests in the white fir series must be maintained in such as way that the understory conifer species are at a level that will result in replacement without crowding out normally occurring shrubs and herbs. Care must be taken to maintain snowpack in the stands and around forest edges to protect species that would be lost with the premature disappearance of snow and the long-term beneficial effects of slow snow melt.

Desired Condition

LSOG plant community targets for trees greater than 20 inches is given below in Table 3-1. For representative target stand tables for all size classes found in NSO activity centers see Tables 2-7 and 2-8.

Table 3-1. Desired ranges of trees per acre in LSOG

General Plant Community	Number of Trees >20" Diameter	Number of Trees >30" Diameter
Pine domination	16 to 44	3 to 11
Mixed conifer	20 to 55	5 to 11
White fir	30 to 45	8 to 14

Riparian Vegetation

Riparian vegetation grows where adequate water from nearby streams and small ponds or high water tables can support a characteristic terrestrial broadleaf deciduous plant community along their margins.

Desired Condition

Riparian areas should be restored to a proper functioning condition (see RMP/ROD). This would require that channelized streams be rehabilitated and streams be allowed to wander on their flood plain. Beaver activity should be encouraged. This may require repairing damaged riparian areas and extensive replanting efforts with native riparian species. Areas around lakes and ponds should be included in these efforts to prevent premature infilling by erosion from slopes and provide shade and nutrients from fallen leaves and other debris.

Aquatic Vegetation

The wetlands that support many of the special status plants in the LSR are at risk from mechanical disturbance. Other threats might come from road building, timber harvest, or construction that directly impacts the plants or alters hydrology.

Desired Condition

Future conditions for aquatic vegetation should meet or exceed their present conditions. Aquatic plants in lakes and ponds are at risk from draining and infilling. Water levels should be allowed to fluctuate at normal (historic) annual levels. Water withdrawal should be managed in such a way as to not harm the basic intrinsic values of the body of water that support their plant and animal life.

Alien Plants and Noxious Weeds

In portions of the LSR where vegetation has been disturbed, native plants should be restored where ever possible. Although there is little hope for total elimination of nonnative species from the Jenny Creek LSR conditions should be restored and, at the least, not made worse than they are today. An

evaluation of nonnative species existing within the reserves should be completed and a plan developed for eliminating or controlling nonnative species within the LSR.

Weed encroachment into the Jenny Creek LSR continues to occur. Yellow starthistle is moving up slope primarily from the California border, and Canada thistle is spreading on road systems throughout the Jenny Creek LSR. These species are seen as the most problematic within the Jenny Creek LSR.

Develop a program to map and document the encroachment of noxious seeds within the LSR. This program should discourage ground-disturbing activities and ensure that disturbed sites are seeded to prevent invasion. Work closely with Oregon Department of Agriculture to encourage continued development and release of biological control agents.

Desired Condition

Contain or reduce the spread of alien plants (especially noxious weeds). Avoid introducing or spreading noxious weed infestation within the LSR and reduce infestations where possible. Protect undisturbed habitat, eliminate weeds, and restore native species in areas where success is a possibility. In general, nonnative species should not be introduced into the LSR.

Special Status Vascular and Non-Vascular Plants

Native species habitat should be restored. Habitat conditions for all special status and survey and manage plant, fungi, and lichen species should be protected and enhanced and not degraded below conditions at the present time. Disturbance processes should be assessed and natural processes allowed to provide diverse habitat associated with healthy populations of special status vascular and non-vascular plants. Retention of present levels or increases will require a thorough knowledge of the species' ecological requirements and include reproductive biology, plant-animal interactions, and community relations.

For species associated with vernal pools, maintain and protect populations at current levels and restore or increase population size as possible in areas of under-utilized habitat. The creation of new habitat is not likely, because of the special relationship among geology, hydrology, and gophers.

Many species could realistically be expected to increase with development of strategies integrating native plant restoration and grazing management, and active habitat enhancement by fire or other means.

Desired Condition

Restore habitat conditions to historic levels were feasible. (Do not degrade below conditions at the present time.)

SNAGS AND COARSE WOODY DEBRIS

Snags

All post-treatment stands should have adequate large snags and trees to ensure that as the stand develops and approaches LSOG conditions, there are a sufficient number of snags and accumulated down logs to allow the stand to be fully functional as LSOG habitat.

An objective of treating young stands will be to ensure that some of the pines, cedar, and Douglas-fir grow to large size as quickly as possible. This could be accomplished by identifying these trees and applying wider thinning, target tree isolation, and fertilization to get them to grow larger and faster than the rest of the stand.

Desired Condition/Recommendations

When management actions take place, the desired target snag level will be prescribed and at least the minimum level will left immediately following action. If the target level is not present, action will be taken within 5 years of treatment to provide the target level. The specific target levels are based on the observed mean stand activity center data plus one standard deviation. Only snags over 16 inch diameter and 16 feet tall "count." All management actions must meet or exceed the snag levels given Table 3-2.

Down Coarse Woody Debris

The objective throughout the LSR is to mimic the down coarse woody debris (CWD) conditions found in representative undisturbed LSOG stands. The emphasis is to retain the largest material available on site. Very large logs perform some functions that smaller logs generally do not. Bear, fisher, and marten cannot den in hollow logs that just meet the minimum RMP/ROD standards for matrix lands (minimum 16 inch diameter by 16 foot length); they need larger logs.

Desired Condition

Minimum CWD goals were set to reflect the average pieces per acre and linear feet per acre found to be present in the NSO activity centers. Target range was set to provide the upper quantities found in suitable LSOG within each ecoregion. Down CWD and snag levels are presented together to compare the relationship between vertical CWD and down CWD levels (see Table 3-2).

Table 3-2. Coarse woody debris desired target levels

Ecoregion	Observed Ave. (Minimum) CWD on ground 16"dia./16'+ in decay class 1 or 2 (Ave. # pieces/acre)	Target Range CWD for 16"dia./16'+ in decay class 1 or 2 (# pieces/acre)	Observed Ave. (Minimum) Snags 16"dia./16'+ (mean snags per acre)	Target Standing Snag level 16"dia./16'+ (Ave. per acre)
Siskiyou Foothills	1.4	2-4	1.9	4.5
Klamath River Ridges	5.2	6-8	6.9	12.5
South Cascades	4.2	5-7	7.2	13.9
South Cascade Slopes **	n/a	6-8	n/a	12.5

* Diameter measured at the large end

** As a result of not having an adequate number of transects in the Southern Cascade Slopes Ecoregion, the target density for that ecoregion will be the same as the near by Klamath River Ridges Ecoregion which is similar in elevation and plant association.

The desired snag targets in Table 3-2 were determined by adding the observed mean density for each size class to the standard deviation of the density for the same size class:

Calculations of Desired Levels were based on the following process.

The target density equation is as follows:

- (Mean density size class a) + (standard deviation size class a) = target density for size class

An example from the data displayed in Siskiyou Foothills Ecoregion Table 2-9 follows:

- Mean density of snags found between 16.0 and 17.9 (inclusive) was 0.50
- Sample standard deviation of the density of that size class was 0.48.
- Desired target would be $.50 + 0.48 = 0.98$ for snags of this size class in LSOG stands in this ecoregion.

An exception to the density target identification procedure described above was made with the smallest size class (8.0" to 15.9"). For this size class in all four ecoregions the mean observed density for the ecoregion was identified as the target. This exception was made for several reasons:

1. It is believed that many of the snags in this size class are the result of suppression mortality of white fir understory. The understory in these stands is much more dense than it would be under more natural fire return intervals and, as a result, unusually high numbers of small white fir snags were observed in many stands.

2. White fir snags in this size class are short lived and are of relatively less value to most LSOG associated organisms than are bigger snags of more persistent species.
3. Observed snag density in this size class is extremely variable across sampled stands within an ecoregion. Therefore, the standard deviation is very high and application of the formula used on the other size classes would result in an high target density for the 8 - 15.9" size class for any given ecoregion. The total snag density target (all size classes) becomes greater than the most snag-rich site observed in the ecoregion if the standard formula is used on this smallest size class. The target for each ecoregion would then be set at a level higher than was observed in what are considered representative functional LSOG stands within each ecoregion. Establishing the mean observed density as the target density for snags of this size class in all four ecoregions will contribute to meeting the objectives of the LSR.

For the South Cascade Slopes Ecoregion with only one sample stand, the target densities for all size classes are the same as for the Klamath River Ridges Ecoregion. This is because there was not a sufficient sample size in the South Cascade Slopes Ecoregion to allow any confident identification of target levels. The Klamath River Ridges targets were adopted because that is the closest ecoregion, ecologically, to the South Cascades Slopes.

WILDLIFE HABITAT

NSO Habitat Types by Ecoregion

LSRs are to be managed to protect and enhance conditions of LSOG forest ecosystems, which serve as habitat for LSOG associated species, including the NSO. These reserves are designed to maintain a functional, interacting, LSOG forest ecosystem. Specific guidelines for maintenance of LSOG forest conditions can be found in Appendix C of the RMP/ROD. The objective for this LSR in terms of actively reproducing NSO pairs is to maintain approximately twenty. This objective should be accomplished as soon as possible.

The Jenny Creek LSR is complex in that it is composed of four ecoregions that are defined by a number of factors, general plant communities, and their potential to provide suitable LSOG habitat. In 1992, the resource area completed a 100 percent inventory and classification of all resource area lands as to their suitability and potential for future suitability for use by the NSOs. Every acre was placed into one of six possible habitat categories. Table 2-4 defines the NSO habitat types, Table 2-5 displays acreage by ecoregion and habitat types.

Ecoregion: Klamath River Ridge Ecoregion (78a)***Habitat Type 1: Nesting***

Protect and maintain nesting function while reducing risks to stand from fire and insects. Maintain functional habitat with large tree component.

Habitat Type 2: Roosting/Foraging

Protect and maintain roost/forage functions. Maintain tree vigor. Encourage development of the large tree component. Reduce risk of stand loss to fire and insects. Maintain canopy closure at 60% or greater.

Habitat Type 3: Potential Habitat Only

Develop into LSOG habitat over time through thinning and individual tree culture.

Habitat Type 5: Dispersal Habitat with LSOG Potential

Restore LSOG characteristics. Accelerate stand development to encourage the creation of roosting/foraging habitat. Encourage development of vigorous open grown trees that maintain dispersal functions.

Ecoregion: Siskiyou Foothills Ecoregion (78b)***Habitat Type 1: Nesting***

Protect and maintain nesting functions while reducing risks to stands from fire and insects. Maintain functional habitat and large trees in the stand.

Habitat Type 2: Roosting/Foraging

Protect and maintain roost/forage functions. Maintain tree vigor. Encourage the development of large tree components. Reduce the risk of stand loss to fire and insects. Maintain canopy above 60% or increase it.

Habitat Type 3: Potential Habitat Only

Develop LSOG habitat. Treatment of these stands should be designed to encourage LSOG structure over time through thinning and individual tree culture. Hardwoods (black oak and madrone) would be encouraged.

Habitat Type 5: Dispersal Habitat with Potential

Maintain dispersal function and restore LSOG characteristics. Encouraging development of large trees. Increase or maintain canopy cover and structural diversity. Reduce risks to insects and catastrophic fires.

Ecoregion: Southern Cascades Ecoregion (4g)***Habitat Type 1: Nesting***

Protect and maintain nesting functions while reducing competition on larger trees.

Habitat Type 2: Roosting/Foraging

Protect and maintain roost/forage function while encouraging development of leave trees. Manage root rots to an acceptable level. Maintain canopy above 60% or increase it.

Habitat Type 3: Potential Habitat Only

Develop LSOG habitat.

Habitat Type 5: Dispersal Habitat with Potential

Maintain dispersal habitat and restore LSOG characteristic while encouraging growth of open full-crown trees. Manage root rot to acceptable levels.

Ecoregion: Southern Cascade Slopes Ecoregion (9i)***Habitat Type 1: Nesting***

Protect and maintain nesting function while reducing risks to stand from fire and insects. Maintain large tree component.

Habitat Type 2: Roosting/Foraging

Protect and maintain roost/forage functions. Maintain tree vigor. Encourage development of the large tree component. Reduce risk of stand loss to fire and insects. Maintain canopy closure at 60% or increase it.

Habitat Type 3: Potential Habitat Only

Develop LSOG habitat. Treatment should be implemented to encourage LSOG structure over time through thinning and individual tree culture.

Habitat Type 5: Dispersal Habitat with Potential

Maintain dispersal habitat and restore habitat with LSOG characteristics. These stands would become roosting/foraging habitat. Encourage development of vigorous open grown trees that maintain dispersal functions.

Desired Condition for LSOG Forest

The desired future condition for the LSRs is to have a functional, interacting, LSOG forest ecosystem made up of forest stands with multi-storied canopy layers and old-growth forest characteristics in the maximum amounts sustainable through time.

Representative numbers of conifer trees per acre in LSOG stands are shown in Tables 2-6, 7, and 8. Stand data gathered from the owl activity centers in the LSR serve as a baseline for

setting target number of conifer trees. Owl activity center stand data summaries are in Appendix G. Treatments in younger stands should be designed to achieve these levels. Levels of hardwood trees per acre vary by plant community and ecoregion, so field guides and ecology data should be used to determine hardwood levels.

LSOG and mid-seral forest stands in both mixed conifer and white fir zones are a critical part of a coarse grained landscape and should be protected and retained within the Jenny Creek LSR. The stands should reflect a vertical and horizontal structure capable of supporting diverse functions and species interactions. Coarse woody debris and snags are critical attributes of LSOG habitat and must be protected and retained. Stands should develop multi-layered structure and gaps provide to encourage diverse species.

Desired attributes:

1. Large tree components are maintained, especially pine and Douglas-fir. Reverse the apparent trend of loss of large trees and snags from a variety of causes.
2. Maintain and improve dispersal conditions within and between LSRs for NSOs and other less mobile LSOG associated species. [NSO dispersal habitat is generally described as stands with at least 40 percent canopy closure of trees at least 11" dbh and at least 40 years old (50-11-40).]
3. Young plantations and natural stands less than 80 years old develop rapidly into LSOG habitat. Density is maintained for rapid growth and only for short periods are below dispersal criteria. Increase spacing around selected trees (pine and Douglas-fir) to encourage the development of large limbs and wide crowns typical of open grown trees. Density is varied to provide diversity of habitats within stands from no thinning to gaps with wide spacing.
4. Dispersal habitat with potential (Habitat Type 5) is restored with multi-canopy components in order to provide suitable habitat conditions within a short time period. This should mainly occur in the Klamath River Ridges Ecoregion within the first decade.
5. Most stands should be multi-layered. It is desirable to have multi-layered stands on north and east aspects with two or three layers on south and west aspects. Density management should be a priority on even-aged stands with a single canopy layer. A diversity of species, age, diameter, and height classes should be developed during density management. Small gaps in the canopy should be used to favor the establishment of natural seedlings.
6. Pine components should be free to grow into overstory position and open enough to where mixed conifer natural regeneration can develop an understory layer. Existing shelterwoods overstory should be retained and the densely stocked understory treated to maintain both the overstory health and the understory vigor. Young stands, both plantations and pole stands, and previously entered mature stands should have density control treatments to maintain

desired growth rates. Average patch size and interior habitat should increase as plantations and young stands mature and older disturbed stands recover.

7. Provide opportunities for understory development. Enable seedlings of desirable species to establish understory layers and increase diversity of habitat. Single canopy layered stands should maintain some dense locations (especially around sensitive species sites) and small openings created in other locations to encourage multi-story and multi-species development.
8. Acquire lands and/or adjust the LSR boundary to increase LSOG habitat patch size and/or dispersal conditions.
9. Protect suitable NSO habitat (Habitat Types 1 and 2) within 1.2 miles of NSO activity centers within the first decade.

Projected potential habitat conditions over an 80-year period:

Projection 1 – A site-by-site projection was made by the LSRA team of the current forest to LSOG habitat over an 80-year period. The current NSO suitable base of 10,525 acres is projected to increase to 13,196 acres after 30 years and to 18,421 acres over the 80-year period (see Table 3-3).

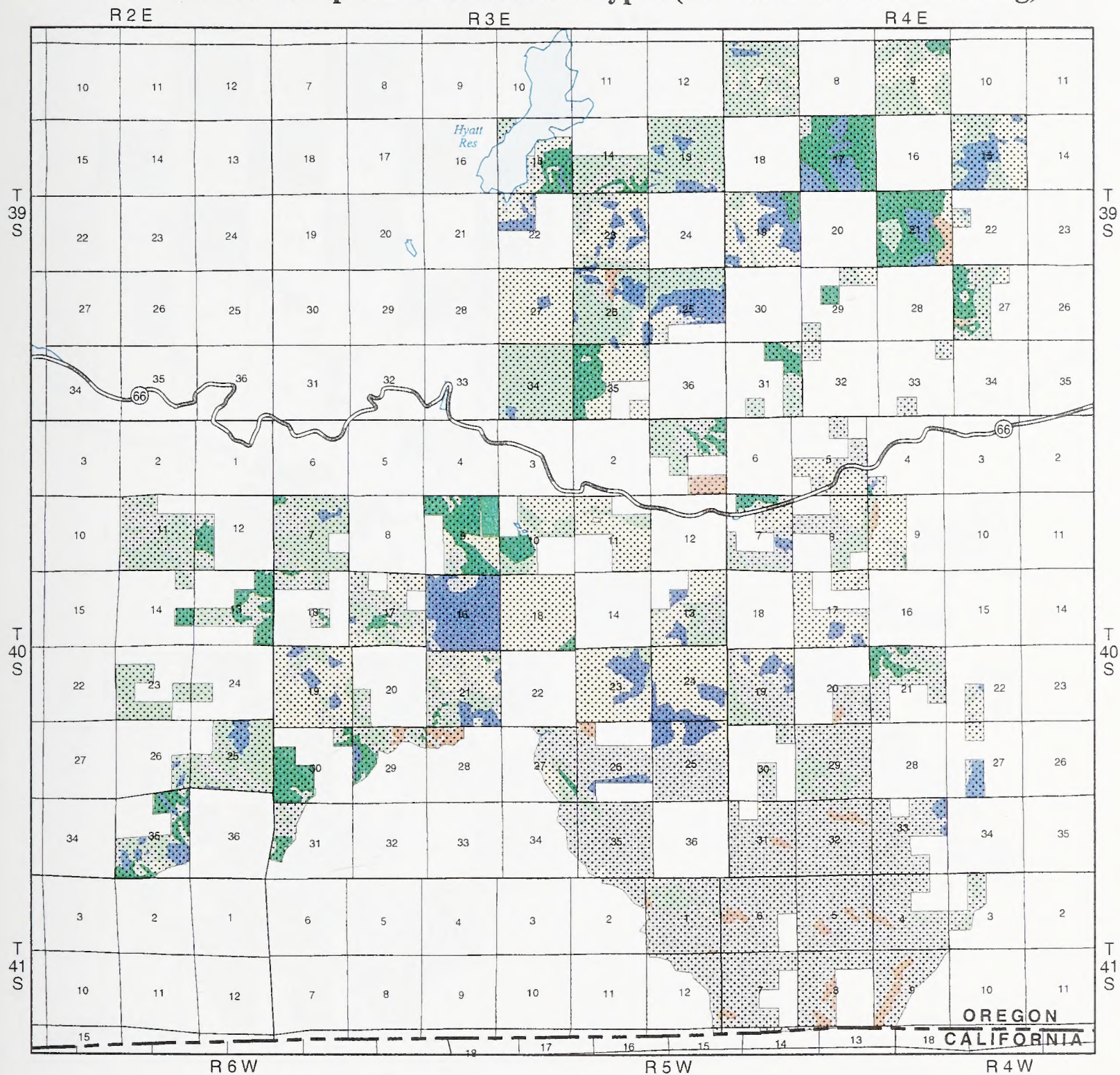
Projection 2 – A separate mapping display of the spatial habitat changes over the 80-year period was also made (while not duplicating Table 3-3 calculated site-by-site acreage it displays a potential spatial habitat landscape):

- Map 3-1 displays the current LSOG habitat locations (10,630 acres).
- Map 3-2 projects potential LSOG habitat after 30 years if Habitat Type 1 acreage is protected and remains static, and *Habitat Type 5* is restored to Habitat Type 2 (up to 18,221 acres). [This level of LSOG acreage would similar to Table 3-3 LSOG acreage after the full 80-year period].
- Map 3-3 displays LSOG habitat after 80 years if all capable forest acreage were to develop into LSOG (the 21,434); a highly optimistic scenario. (Mapping assumptions were Habitat Type 1 acreage remains static and Habitat Type 3 and 5 develop into suitable Habitat Type 2.)

Table 3-3. Projected future condition over 80-year period by habitat type and ecoregion

Ecoregion	Habitat Type 1 Nesting (Ac)			Habitat Type 2 Roosting/Foraging (Ac)			Habitat Type 3 Young Stands (Ac)			Habitat Type 5 Dispersal with Potential (Ac)		
	Current	30 yrs.	80 yrs.	Current	30 yrs.	80 yrs.	Current	30 yrs.	80 yrs.	Current	30 yrs.	80 yrs.
Siskiyou Foothills	949	1,186	2,372	2,115	2,344	1,657	416	297	0	711	364	162
percent of area	16%	21%	41%	37%	41%	29%	7%	5%	0%	12%	6%	3%
South Cascade Slopes	95	190	665	462	580	697	148	99	0	821	657	164
percent of area	2%	3%	12%	8%	10%	12%	3%	2%	0%	15%	12%	3%
Klamath River Ridges	508	1,016	1,651	1,257	2,011	3,394	1,222	611	0	3,237	2,586	1,179
percent of area	4%	8%	13%	10%	16%	27%	10%	5%	0%	26%	21%	9%
Southern Cascades	1,580	2,107	4,213	3,559	3,762	3,772	1,413	706	202	2,544	2,521	909
percent of area	15%	21%	41%	35%	37%	37%	14%	7%	2%	25%	25%	9%
Total Ac	3,132	4,499	8,901	7,393	8,697	9,520	3,199	1,713	202	7,313	6,128	2,414
Percent of LSR	9%	13%	26%	22%	26%	28%	9%	5%	1%	22%	18%	7%

Jenny Creek Late Successional Reserve Present Northern Spotted Owl Habitat Types (Modified McKelvie Rating)



1 0 1 2 Miles
1 0 1 2 Kilometers

LEGEND

- Habitat 1 (3,220 acres): Nesting
- Habitat 2 (7,410 acres): Roosting/Foraging
- Habitat 3 (3,213 acres): Young Stands
- Habitat 4 (12,257 acres): No Potential
- Habitat 5 (7,591 acres): Dispersal with Potential
- Habitat 6 (800 acres): Dispersal with No Potential
- Jenny Creek Late Successional Reserve

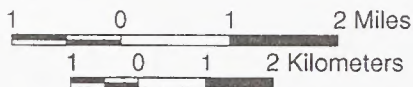
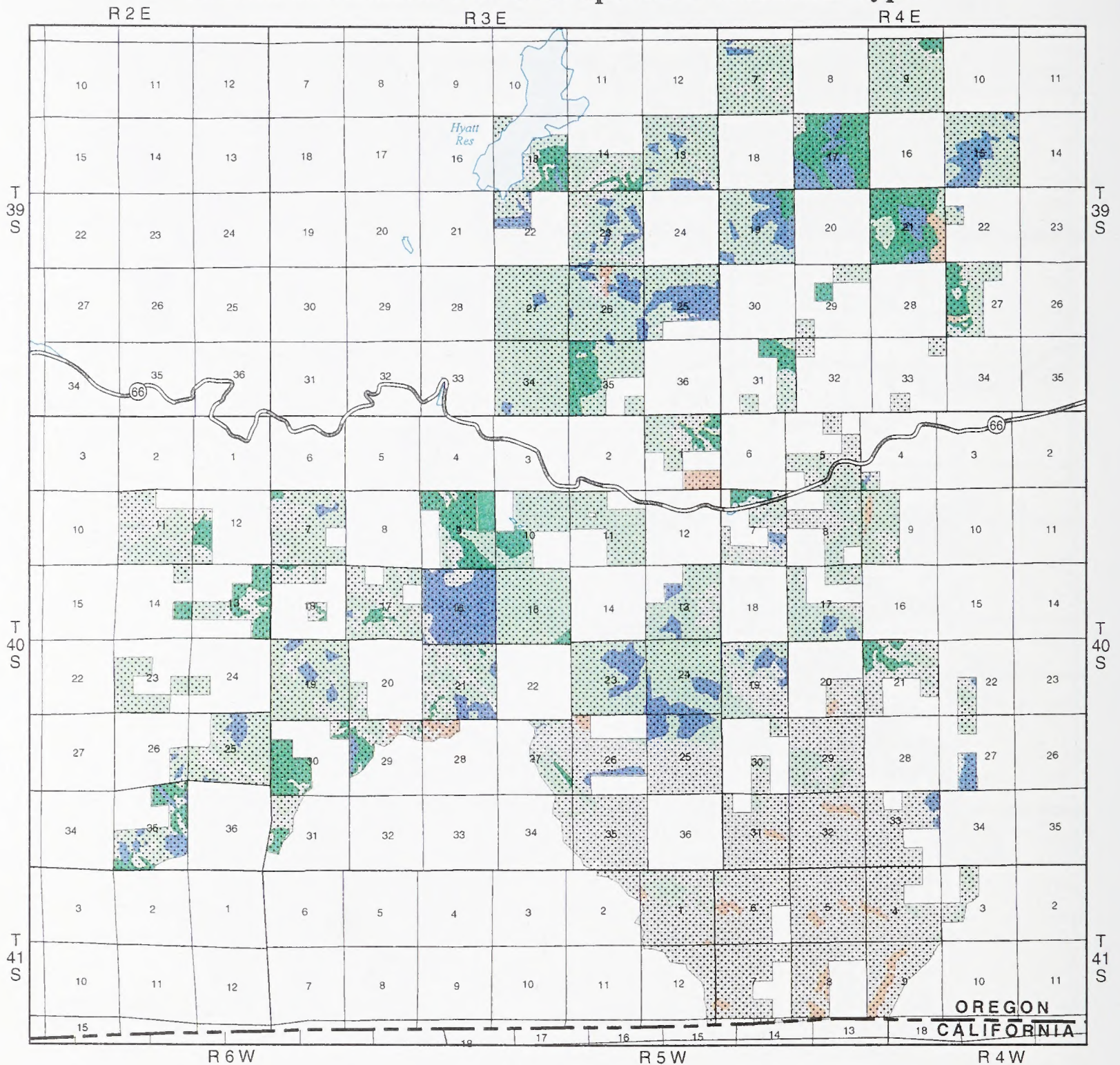


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MAP 3-1

Jenny Creek Late Successional Reserve 30-Year Horizon for Northern Spotted Owl Habitat Types



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LEGEND

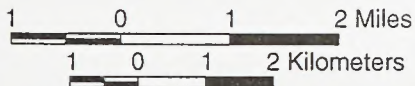
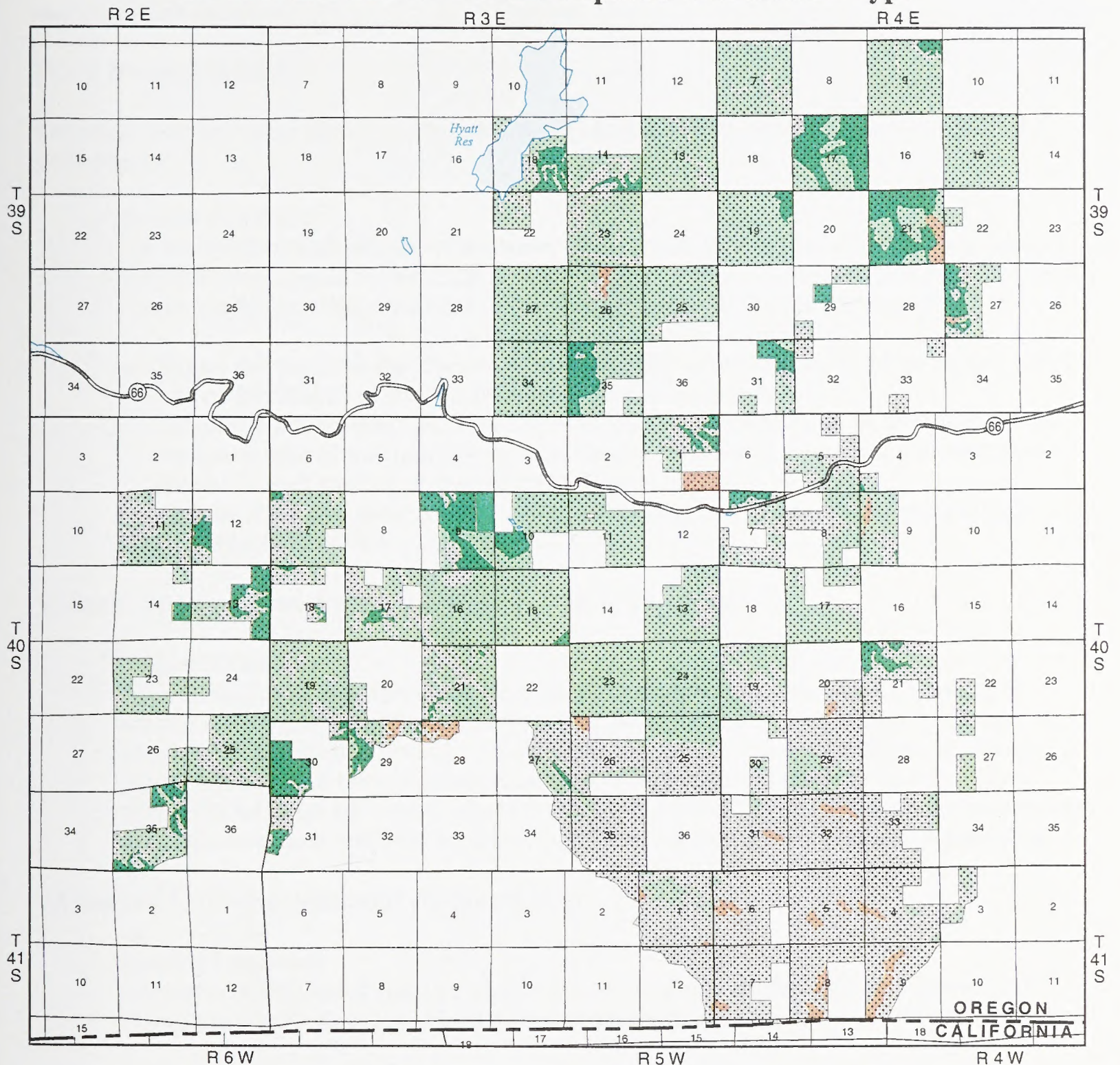
- Habitat 1 (3,220 acres): Nesting
- Habitat 2 (15,001 acres): Roosting/Foraging
- Habitat 3 (3,213 acres): Young Stands
- Habitat 4 (12,257 acres): No Potential
- Habitat 6 (800 acres): Dispersal with No Potential
- Jenny Creek Late Successional Reserve



MAP 3-2

D03-02-00:JR

Jenny Creek Late Successional Reserve 80-Year Horizon for Northern Spotted Owl Habitat Types



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LEGEND

- Habitat 1 (3,220 acres): Nesting
- Habitat 2 (18,214 acres): Roosting/Foraging
- Habitat 4 (12,257 acres): No Potential
- Habitat 6 (800 acres): Dispersal with No Potential
- Jenny Creek Late Successional Reserve



MAP 3-3

D03-02-00:JR

NSO Home Ranges

Objective is to maximize habitat quality and quantity to increase the reproductive potential of the owls present.

Desired Condition

The desired future conditions within home ranges inside the LSR are to maintain at least 40 percent of the 1.2 mile radius circle around the site center in a suitable habitat condition, and to preserve the most important and intensively used areas in NSO home ranges.

- Protect and maintain the function of existing NSO habitat within the home ranges. (No loss or degradation of suitable habitat within the first decade.)
- Retain and protect the designated 100-acre NSO activity centers as no treatment refugia until such time as we know how to treat these areas in a way consistent with retention of functions, such as NSO nesting (Habitat Type 1).
- Acquire additional lands within NSO home ranges as per the land acquisition criteria described in Chapter 4.

Known Spotted Owl Activity Centers (100-Acre LSRs)

Desired Condition

The desired LSO conditions described above also apply within the known spotted owl activity centers that are not protected by within large LSRs or Administratively Withdrawn Areas. NRF habitat would not be treated in the first decade, but these 100-acre LSRs have a greater likelihood of being maintained if fuel conditions around them are treated. Focus treatments on forest age classes adjacent to suitable habitat that may be manipulated to protect from risk conditions and/or to accelerate stand development toward LSO characteristics.

Managed Late-Successional Areas (MLSA)

Desired Condition

Unmapped LSRA result from the application of Protection Buffer and some Survey and Management NFP direction. Habitat management will be in conformance with NFP direction.

Critical Habitat Unit (OR - 38) - NSOs

The objective for the Critical Habitat Unit (CHU) which overlaps the LSR is to provide nesting, roosting, foraging, and dispersal habitat for linkage between the western Cascades and Klamath provinces through the I-5 area of concern (see Map 1-4).

Desired Condition

The goal or desired future condition for that portion of the LSR in CHU (OR-38) is to have each stand functioning at its highest habitat potential be it nesting, roosting, foraging, or dispersal habitat. These objectives are identical to those of the LSR, thus the standards and guidelines for that land-use designation will ensure that these lands will be managed to meet critical habitat objectives.

Develop and retain LSOG structure in stands that have the potential to become LSOG habitat. Manage Habitat Types 3 and 5 stands so they develop into Habitat Type 1 or 2 stands as soon as possible. Emphasis will be to create nesting, roosting, or foraging habitat.

Protect functional habitat from catastrophic loss due to wildfire. Generally, average fuel conditions will be such that flame length will be less than 4 feet.

Deer Winter Range

Objective is to provide high quality forage and thermal cover and to minimize vehicular disturbance during the winter months. This is particularly critical in the area south of State Highway 66.

Desired Condition

The desired future condition is to have native grasses, forbs, and shrubs in good condition and available to deer. It is also desirable to have all timber stands that are capable of providing thermal cover function in that capacity. The open road density should be no greater than 1.5 mile per square mile.

- Convert areas now dominated by exotic grasses and forbs to native species that would be endemic to the sites.
- Design management actions to avoid spreading noxious weeds.
- Regenerate decadent brushland.
- Ensure overgrazing does not occur on the winter range.
- Put forest stands with the potential to function as thermal cover on a silvicultural trajectory that will enable them to attain this function.
- Keep open road densities at 1.5 miles per square mile or less.

Deer Summer Range

Objective is to provide forage for the deer herd that spend the summer in the higher elevations of the LSR. This will be increasingly difficult as stands develop LSOG habitat characteristics, particularly in closed canopy stands. Management activities designed to enhance forage on deer summer range would not occur in cases where it would prevent or retard development of LSOG habitat. Land with no LSOG habitat potential (Habitat Type 4) could be managed for forage production. Another objective is to assist ODFW with correcting the buck/doe ratio problem that has developed in recent years.

Desired Condition

There will be high quality forage conditions in natural meadows and brush fields (all areas not capable of growing LSOG habitat). There would be sufficient hiding cover and a sufficiently low open road density to allow a much higher buck survival rate through the general rifle deer season.

- Forage habitat conditions should be restored to historic natural meadows and brush fields levels. Methods may include combinations of management actions, such as burning, noxious weed removal, fertilization, regeneration by pruning, and copicing.
- Close roads that are no longer needed due to the LSR designation, either in the short-term or permanently.

Riparian Reserves

Species that would benefit by the prescribed Riparian Reserve widths include: fish, mollusks, amphibians, lichens, fungi, bryophytes, vascular plants, American marten, red tree voles, bats, and the NSO. The maintenance and creation of habitat for these species should be the goal of any management actions in the Riparian Reserves.

Desired Condition

Functional bands of LSOG riparian habitat should merge gradually into the surrounding landscape. This habitat would have target or higher amounts of coarse woody debris, snags, and large trees than the rest of the LSR acreage.

Interim widths for Riparian Reserves, as proposed in the Standards and Guidelines (NFP/ROD, p. C-30), are adopted for the Jenny Creek LSR. Interim widths may be increased or decreased if, and when, the watershed analyses recommend those changes as appropriate. Such changes can be accomplished through the iterative process of the watershed analysis. Otherwise, an interim width at a site-specific location could be changed only if analysis of data gathered for a proposed project indicates that target species will benefit by the change and other species would not be negatively impacted.

Protection Buffer Species

The analysis prepared by the Scientific Analysis Team for the NFP/ROD and enhancement of late-successional and old-growth forest ecosystems indicated that additional measures were needed to ensure viability of the following rare and locally endemic species in areas outside of designated reserves: great gray owl, white-headed woodpecker, black-backed woodpecker, pygmy nuthatch, and flammulated owl.

The objective of protection buffers and snag retention is to ensure the long-term viability of those species deemed to need these protection measures.

Desired Condition

The desired future conditions for the habitat of the great gray owl is to have meadows with large defect trees, snags, and down wood around their edges. These meadows would have high populations of small rodents for forage. Also, stands around nest sites will be protected from impacts that would reduce the canopy closure or number of snags and defect trees.

All stands with the site potential to provide abundant snags of the appropriate species, size, and decay classes should support 100 percent of the potential woodpecker populations.

Great gray owl nest sites receive a 0.25 mile buffer from management activities that could reduce or degrade habitat features essential to nesting and rearing. The forest stands around meadows and other natural openings should be protected by 300-foot buffer. Any activity that would occur in these buffers should not degrade the overall habitat features essential to great gray owl nesting, rearing, and foraging. Also, levels of meadows use should be managed to maintain or restore grass and forb layer to the point that small rodent populations are not negatively effected.

Implement inventory and monitoring protocols for the species discussed above so that when activities are implemented protection buffers can be applied where needed.

Survey and Manage Mollusk Habitats

Objective is to provide suitable habitat for these species so they can carry on their essential life functions and functional ecosystem roles.

Desired Condition

The desired habitat conditions vary by species and are largely unknown.

Apply the same survey protocols and management recommendations within the LSR as applied outside it. If there is any ambiguity as to interpretation of either the survey protocol or the management recommendations, use the more protective (conservative) interpretation.

WILDFIRE - FUEL MANAGEMENT CONDITIONS

Objectives are to protect existing LSOG forests and manage younger forests toward LSOG characteristics. Fuel management activities (FMA) in the LSR are to minimize damage to existing and potential LSOG habitat and other resource values, such as soil and water, from wildfires which may occur.

Desired Condition

Large stand replacement or high intensity fires are not desirable within the LSR. Although large, severe wildfires are a low probability in the Jenny Creek LSR, the use of prescribed fire

will help to insure when wildfires do occur the intensities will be low to moderate. Fires with low intensities will reduce surface and ladder fuels and tree densities. Young dense stands contribute to stress and mortality of mature conifers and hardwoods. Moderate intensity fires are desirable if they create small openings (less than 5 acres) which would allow for regeneration to occur and create additional snags and concentrations of down woody debris. The reintroduction of fire will enhance the regeneration of fire-dependent species and create forest structures and landscape patterns that are comparable to those developed under the more frequent fire regimes of the past particularly in the southern portion of the South Cascade Slopes and Klamath River Ridges Ecoregions. Restoring these conditions will make stands more resilient to insect infestations, disease, and catastrophic fire, thus reducing the risk of long-term ecosystem disruptions.

Variability of fuel conditions across the landscape is desired, with some areas having high concentrations of fuel intermixed with areas of low fuel accumulations. It is reasonable to expect that heavier scattered pockets of fuels will occur on relatively cool, moist sites, such as those found on north and east tending slopes, or low on the slope adjacent to perennial riparian areas. South and west tending aspects and upper slope positions, which are typically drier and harsher, should generally contain lighter fuel loadings with fewer scattered pockets of heavy fuel.

In general, manage average fuel conditions such that flame lengths will be less than 4 feet.

- Reduce the chance of large crown fires in LSOG habitat by reducing ladder fuels in the understory; particularly within suitable owl habitat, and surrounding habitat with moderate or high fire hazard. Although it was recognized that much of the LSR is characterized as low risk or with areas that would have low flame lengths, it should be understood that with the presence of dense understory white fir ladder fuels and accumulated fine fuels, it is very likely wildfire will move into the forest crown resulting large scale to catastrophic losses of current or potential LSOG habitat.
- Use prescribed fire to manage activity fuels that remain after stand treatments. Fine fuels should be reduced where land treatments have allowed vegetation to accumulate to unacceptable levels.
- Reduce over-accumulated vegetation fuel loadings as a result of altered fire cycles within the previously low and moderate severity fire regime areas. Much of this area is located within the grasslands, shrublands, and woodlands (Habitat Types 4 and 6).

RANGE MANAGEMENT

Since the completion of the *Medford District Rangeland Program Summary* in 1992, short-term monitoring data has been collected. The primary goal of this data was to verify that livestock

numbers are within the carrying capacity of the range. This action is the backbone of the rangeland management program and provides the first step to ensuring plant vigor, rangeland health, and watershed condition.

Utilization studies are presently being completed on allotments with interim stocking rates to determine whether there are distribution or additional stocking rate problems. Currently, the stocking rates within the Jenny Creek LSR are believed to be within the grazing allotment carrying capacity.

Substantial improvement in riparian and upland health has occurred within the Jenny Creek LSR both on public and private forest lands. Riparian restoration and the Jenny Creek riparian volunteer projects are responsible for this improved riparian and upland condition. Fencing, enclosures, spring development, planting stream side vegetation, and livestock handling have contributed to this success. Water developments within the Jenny Creek LSR has shown positive results. Fence construction at lower elevations may be cost effective, while snow damage at higher elevations tends to create a maintenance problem. This results in periodic major expenditures to reconstruct these fences.

Extensive research suggests that critical growth-period rest is not a requirement for grass plants if enough leaf area is retained to replenish root reserves. Grazing during most of the growing period followed by dormancy due to dry conditions may limit vigor on lower elevation ranges in the Jenny Creek LSR. The majority of grass plants within the Jenny Creek LSR are not limited by utilization or dry conditions.

If stocking rates within the Jenny Creek LSR are within the carrying capacity of the land, then animal husbandry practices must be considered as contributing to the remaining problems. These include conflicts within the rural interface, livestock distribution with localized excessive utilization, and loss of stream side vegetation within riparian zones. Rangeland management direction must be accompanied by good animal husbandry practices or these issues will not be resolved. Practices needed include: riding, animal placement, timely movement and removal of stock, salting, water development, and possibly fencing to enhance distribution. Livestock handling is seen as the weakest link in present management.

Desired Condition

Manage to provide healthy and productive riparian systems with diverse plant and wildlife species.

Provide suitable habitat conditions that ensure survival and perpetuation of special status species.

Manage for vigorous and healthy rangeland ecosystems that provide for watershed function and soil stability, and provide forage for existing livestock operations.

Develop a site-specific allotment management plan for those allotments within the LSR that require improved management to meet land use objectives. A thorough review of proposed improvements to resolve distribution and management problems should be completed.

Continue to work with rural interface homeowners to resolve conflicts.

TRANSPORTATION SYSTEM

The goal is to maintain our transportation system in a safe and environmentally sound condition. The result is a transportation system that provides for various recreational activities, private access, logging, fire fighting access, and other land management uses. Road maintenance includes activities which reduce soil erosion potential and provide for fish passage at all potential fish-bearing stream crossings. Proper maintenance of road drainage systems and stream crossing culverts is essential to avoid both erosion and fish passage problems. Most of the existing culverts are designed to withstand 50-year flood events. BLM will design new drainage structures to withstand a 100-year flood event and, when applicable, provide for fish passage. Erosion mitigation measures include: constructing drainage structures; vegetation stabilization projects; grass, forb, and shrub seeding or planting native species; blocking roads; and placing road surface rock. The transportation system in this watershed is generally stable and does not require a high maintenance level. Road maintenance also includes removing safety hazards. Hazard trees next to forest roads are removed if they have the potential to fall into roadways. They are usually dead, but may be alive with roots undercut or with significant physical damage to the trunk or root system which makes them unstable.

In order to address the issues listed above, the LSRA team performed an analysis of the transportation system in the LSR. Items considered were: need for future access to both private and BLM lands, historic use of specific roads, roads which were known to bisect or access sensitive areas, and fire access.

A working map was created documenting recommended changes to the existing transportation system that would aid in achieving the desired LSR objectives. This working map is on file with the engineer group of the Ashland Resource Area.

Desired Condition

Maintain transportation system in a safe and environmentally sound condition. Reduce soil erosion potential and provide for fish passage at all potential fish-bearing stream crossings. Reduce road use and/or restore areas in sensitive locations. It is unreasonable to assume that a target road density would apply to all land forms, across all watersheds. Roads will be assessed on the seventh field watershed scale will two miles per square mile a target to reduce toward (this does not imply that two miles of road is an acceptable level in all areas within the LSR). Road providing access to private lands will be maintained in a condition that minimizes aquatic resource damage and enhances connectivity as feasible.

GEOLOGY AND SOILS

Fragile Soil

Fragile (Sensitive) Soil, is an RMP/ROD administrative designation. Fragile Soils are designated in the BLM Medford District's Timber Production Capability Classification (TPCC). The RMP refers to Fragile Soils under Appendix 2-WA-1, Best Management Practices (BMPs). For the Jenny Creek LSR, this category refers only to Fragile Mass Movement (FP: Fragile Pyrochlastic) TPCC category. BMPs for fragile soils were designed for timber harvest and related activities, and wildfire scenarios.

Desired Condition

- Minimal surface disturbance on fragile soils (USDI 1992, App. 2-WA-1).
- The erosion rate and soil loss should be equivalent to similar soils in an undisturbed condition.

Soil Productivity

Nutrient cycling is essential to maintain and enhance LSOG forest ecosystems. Soil organisms play a key role in forest ecosystem nutrient cycling. Soil organisms include: vertebrates and invertebrates (worms; arthropods, including insects; slugs and snails) plants, fungi, and bacteria. The persistence of desired soil organisms is essential for the breakdown of organic matter into materials available to plants.

Natural nutrient recycling is essential in order to sustain long-term soil productivity in a LSOG ecosystem. Factors limiting soil micro-organism population types and numbers need to be closely evaluated before management actions occur. Also important to nutrient recycling are the numbers and types of arthropods and other organisms that initially break down the organic material for decomposition by soil micro-organisms.

Desired Condition

Maintain and enhance soil productivity in the LSR. Soils in the LSR should be highly productive with a fungi dominated micro-organism population and ecological conditions that favor optimal nutrient recycling.

- Apply BMPs (RMP/ROD) during all ground and vegetation disturbing activities.
- Utilize silvicultural systems that are capable of maintaining or improving long-term soil productivity.
- Provide a renewable supply of large down logs well distributed across the landscape in a manner that meets the needs of soil organisms and provides for ecological functions.
- Manage vegetative fuel loading in a manner that prevents wildfire behavior with high temperature intensities and long duration.
- Sample and monitor soil micro-organism populations to establish baseline data and evaluate affects of management activities.

Unstable Lands

Desired Condition

On active slumps, earthflows and toe zones maintain CWD concentrations and fine fuels where landsliding has created barren areas, reducing size or continuity of concentrations as needed to reduce fire risk. Reduce fine fuels (<1 inch) as needed while meeting soil cover objectives.

HYDROLOGY AND AQUATIC RESOURCES

Stream Channels and Floodplains

The system of stream channels, floodplains, and riparian habitat that characterize watersheds is one of the most outstanding resource values in the Jenny Creek LSR.

Floodplain areas in some reaches of the Jenny Creek Watershed are heavily impacted by historic stream modification. As stream elevation has decreased, floodplain water tables have dropped significantly, reducing the extent of riparian vegetation and wetlands. Sediment is no longer regularly removed from the streambed and captured by the floodplain, and the floodplain is no longer able to absorb stream energy during high flows. Downstream aquatic ecosystems are at risk due to increased peakflows and sedimentation. Spawning and rearing habitat for resident fish is lacking in some areas. Coarse woody debris is absent from most stream reaches. Riparian vegetation is recovering along most reaches on BLM land where cattle have been excluded, but additional protection from grazing is warranted. Most roads in the LSR are located away from stream channels, and stream crossings are adequate for the most part.

The Emigrant Creek Watershed is steep. Downcutting is not serious but some bank instability is apparent. Riparian vegetation is well established on most BLM lands.

Current management practices on BLM land are consistent with standards derived from the NFP/ROD, RMP/ROD, and other policies and directives that ensure reasonable protection for stream channels and floodplains on Bureau lands. Additional control of trespass and allotment cattle may be necessary to ensure adequate streambank and riparian recovery.

The BLM may not be able to attain natural conditions because of ongoing management practices on private lands within these watersheds and because of water diversions from the Jenny Creek Watershed.

Desired Condition

All stream channels and floodplains in the Jenny Creek and Emigrant Creek Watershed should be returned to functioning condition. Management activities in Riparian Reserves shall be

done in compliance with Aquatic Conservation Strategy Objectives. Restoration of riparian vegetation would be a priority.

The desired condition for stream channels is to have depth/width ratios that ensure maintenance of water tables and access to floodplains. Channels should have natural meander, and suitable pool/riffle relationships and channel width/depth ratios that will provide diverse habitat for the wide variety of native organisms throughout their life histories. Sediment should be adequately transported and deposited on floodplains. Riparian vegetation should have a diverse species and age composition that creates shading as well as wildlife habitat, yet provides coarse woody debris to the stream, banks, and floodplain. Streams should attain proper functioning condition.

Key Watersheds

Jenny Creek is a Key Tier 1 Watershed (see Map 1-7). These are the highest priority for watershed restoration (NFP/ROD p. C-7). Key Watersheds serve as refugia for maintaining and recovering habitat for at-risk stocks of anadromous salmonids and resident fish species. Tier 1 (Aquatic Conservation Emphasis) Key Watersheds contribute directly to conservation of at-risk salmonids, bull trout and resident fish species. They also have a high potential of being restored as part of a watershed restoration program and will receive priority in any watershed restoration program. Management activities will comply with the Aquatic Conservation Strategy (ACS) Objectives (NFP/ROD) and BMPs (RMP/ROD).

1. Roads located in Riparian Reserves will be relocated, decommissioned, or brought up to appropriate standards (USDI 1992, pp. 162-164).
2. Construct or improve all stream crossings to allow for adequate fish passage and to accommodate at least the 100-year flood, including associated debris (USDI 1992, p. 87). Any human-made berms that restrict floodplains shall be removed.
3. Alterations in grazing prescriptions shall be made wherever livestock may be contributing to streambank instability or delay of riparian recovery (USDI 1992, p. 172).
4. Planting of riparian trees may be warranted if natural recruitment of vegetation is slow or lacks diversity. Riparian surveys should be completed throughout the LSR.

Desired Condition

See Jenny Creek Watershed Analysis.

Deferred Habitat Watersheds

A deferred watershed is an RMP/ROD administrative designation that defers an area from habitat management for a ten-year planning period. A subcompartment of the Keene Creek subwatershed

that drains into Parsnip Lakes toward springs that feed into Keene Creek is such a deferred watershed (see Map 2-9). The area was heavily logged on public and private lands, creating large compacted areas and sediment in one of the lakes.

Desired Condition

Partial hydrologic recovery of the subcompartment in the next decade. Protect and enhance conditions of LSOG forest related species (NFP/ROD, A-4). This includes the species and organisms of the soil.

- Maintain existing protection status described in the NFP/ROD and RMP/ROD.
- Enhance recovery by coordinated efforts with private landowners for appropriate monitoring and restoration.

Water Quantity

Annual flow patterns in many streams are characterized by extremes with flood events in winter and spring months, and low flows, or dry channels in summer and fall months. Floods are responsible for deposition of sediment on floodplains, introducing coarse woody debris to the stream channels, and establishing natural meander with pools and riffles. Floods can also be damaging. Fish and macroinvertebrates are lost in these events and riparian vegetation is often destroyed.

Low summer flows and high water temperatures are most often linked together and usually result in impacts to aquatic organisms. As stream flows are reduced and temperature rises, competition for space and food increases. The metabolism rate in fish increases, therefore, the demand for food is greater. There is a greater risk of disease and predation.

Excessive roading and clearcuts in transitory snow zones often contribute to accelerated snow melt and runoff during winter storms. This situation adds to both flood events and a depleted water supply for summer streamflows. It is anticipated that this will continue to be a problem on private lands. Future management of federal lands should help alleviate the current situation.

High winter and spring flows contribute to the water table and bank storage. The potential for bank storage is lessened, however, when stream channels become too incised to allow bank storage.

Jenny Creek is a water-poor stream due to diversion of water from the basin by Talent Irrigation District (TID) and use of instream flows for irrigation within the basin. TID diverts an estimated thirty percent of the annual runoff in the basin.

The NFP/ROD and RMP/ROD provide management direction for LSRs which is to restore LSOG characteristics to forest ecosystems. The NFP/ROD also directs that Key Watersheds are the highest priority for watershed restoration. BLM can make some difference in future water supply, but it cannot control all of the factors within the Jenny Creek and Emigrant Creek watersheds that

contribute to the impaired water supply. Logging on private lands within the perimeter of the Jenny Creek LSR, and water withdrawals will continue to contribute to extremes in flow patterns.

Desired Condition

The desired future condition is to have stream systems with adequate flows to sustain aquatic resources at natural levels. This scenario is coupled with more natural winter and spring snow melt and runoff.

Water Quality

Water quality degrades whenever levels of turbidity, temperature, and bacteria are elevated, or when accidental chemical or fuel spills occur. Roads, past and present logging, past and present livestock grazing, and natural events influence water quality in the Jenny Creek and Emigrant Creek watersheds. Changes in stream channels, riparian habitat, and summer flows also contribute to degraded water quality.

Whenever water quality becomes degraded, aquatic resources begin to suffer. Some macroinvertebrates diminish or disappear as water temperature increases, or because of excessive sediment. Fish become stressed and suffer from outbreaks of disease that are encouraged by elevated water temperature. Fish may experience spawning failure due to high levels of turbidity and sediment deposits over gravel bars. Unnatural algae growths and invasive aquatic plants often accompany poor water conditions.

Current management prescriptions, as outlined in the NFP/ROD and RMP/ROD, are appropriate for improving water quality on BLM lands. The BLM, however, has little control over management practices on private lands or over water diversions from the Jenny Creek Watershed. Current timber harvesting on private lands and grazing practices may result in accelerated winter runoff, increased turbidity and sediment, and impaired riparian habitat.

Desired Condition

The desired condition for water quality in the Jenny Creek and Emigrant Creek watersheds is for temperature, turbidity, and bacteria to drop to levels in the summertime that would support all natural aquatic fauna and flora, and be within parameters established within the Oregon Department of Environmental Quality (DEQ) Water Quality Standards.

All management activities shall be done in compliance with the Aquatic Conservation Strategy Objectives. Road maintenance, timber harvest, livestock grazing, and other management activities should be undertaken following BMPs (RMP/ROD pp. 149-178). Riparian plant communities should be evaluated to determine if planting or thinning might benefit stand conditions. The long-term objective is to improve water quality to levels that adequately support thriving populations of native fish and macroinvertebrates that provide high quality water for downstream requirements.

SPECIAL MANAGEMENT AREAS

The Jenny Creek LSR contains five special management areas or portions thereof: the Cascade/Siskiyou Ecological Emphasis Area (CSEEA), the Soda Mountain Wilderness Study Area (WSA), the Oregon Gulch Research Natural Area (RNA), the Jenny Creek Area of Critical Environmental Concern (ACEC), and the Pacific Crest National Scenic Trail (PCNST) (see Map 1-9).

The continuing significance of the special management areas in the LSR depends on the maintenance of conditions that originally led to their establishment. This might include the exclusion of devastating wildfire (but not the exclusion of fire); stopping or reversing, if possible, the invasion of alien weeds; and natural ecosystems restoration whenever possible. These designated areas have restrictions that will limit management options.

Soda Mountain Wilderness Study Area

The Soda Mountain Wilderness Study Area (WSA) (Map 1-9) is a 5,867-acre roadless area south of Soda Mountain and north of the California border. The area has been studied for wilderness values and suitability and has been recommended by BLM for designation as wilderness. Approximately 800 acres along the eastern boundary of the WSA are within the Jenny Creek LSR.

Section 603 of FLPMA requires BLM to manage lands under wilderness review in these words:

During the period of review of such areas and until Congress has determined otherwise, the Secretary shall continue to manage such lands ---- so as not to impair the suitability of such areas for preservation as wilderness.

The WSA currently has OHV problems on an occasional basis (usually associated with deer hunting season).

Desired Condition

The desired future condition for the WSA is to have it remain in as natural a condition as possible.

Hyatt-Howard Special Recreation Management Area

The Hyatt-Howard Special Resource Management Area (SRMA) is an area around Hyatt Lake and Howard Prairie Reservoir (approximately 42,000 acres) where a commitment has been made to provide specific recreation activities and experiences on a sustained yield basis.

The management objective for the SRMA is to provide recreation opportunities ranging from semi-primitive to roaded in a natural manner that will:

- Promote public use and enjoyment of the public lands;

- Protect natural resource values on the public lands;
- Minimize conflicts among users; and
- Protect the health and safety of recreationists who use the public lands.

The existing developed facilities and opportunities do not adequately serve the existing and projected needs of the recreating public.

Desired Condition

The desired future condition for the SRMA will be achieved when the actions in the Recreation Area Management Plan (RAMP) have been implemented.

Additional camping opportunities within the existing developed sites will be provided, play areas will be constructed, facilities will be improved, and maintenance and use supervision will be increased. Dispersed use will continue as long as it is consistent with the goals of the LSR.

Remove portions of sections 15 and 22 of T39S, R3E fully developed as a campgrounds that are adjacent to the reservoir from the LSR. Avoid development of new recreation facilities within the LSR if other alternatives are available.

Applegate Trail

The Applegate Trail was designated as part of the California National Historic Trail in 1992. This trail was created in 1846 as an alternative route into the Willamette Valley from the Oregon Trail. The trail traverses the LSR from Greensprings summit to Grouse Butte following much of what is now Highway 66 that runs east-west through the center of the Jenny Creek LSR. Approximately 0.8 miles is on BLM land near Lincoln.

Activities within the general area of the trail route would require archaeological surveys, and if sites were discovered, appropriate measures could be taken. BLM's objectives are to do avoid activities that would negatively impact sites associated with the Applegate Trail, unless approved by the State Historic Preservation Officer or managing agency.

Desired Condition

The desired future condition for the Applegate Trail is to have significant segments or features preserved and interpreted for area visitors.

Pacific Crest National Scenic Trail (PCNST)

The Pacific Crest National Scenic Trail (PCNST) (Map 1-9) is a 2,638-mile trail from Canada to Mexico that traverses north-south across the LSR. Approximately 12 miles are within the Jenny Creek LSR near Hyatt Lake and Hobart Bluff Ridge. It was designated in 1968 with the passage of the National Trails System Act.

The PCNST within the Medford District is to be managed as a Special Recreation Management Area (SRMA) with this designation covering the lands within 50 feet on each side of the trail. The lands within 0.25 mile of either side of the trail are to be managed as Visual Resource Management (VRM) Class II lands to protect scenic resources (see Map 1-9).

The trail, as managed, meets the objectives as stated in the Comprehensive Plan, so the desired condition is already achieved and will be maintained by the management objectives.

Desired Condition

The desired condition for the PCNST is to have a trail that meets the management objectives as stated in the PCNST Comprehensive Plan which are:

Within Federal lands outside National Parks and Wilderness (57 percent of the trail), the trail must co-exist in harmony with all other resource uses and activities of the land as determined through the land management planning process. The trail will cross a mosaic of areas differing in primary management emphasis. This could be grazing, key wildlife habitat, special interest such as scenic or geologic, developed recreation, unroaded recreation, research natural areas, or intensive timber management. Viewing and understanding this array of resources and management is one of the primary recreation opportunities to be made available over these portions of trail.

Elk Management Area

The elk management area in the Jenny Creek watershed was established to emphasize elk management and falls mainly in the Klamath River Ridges and South Cascade Slopes Ecoregions. The elk management area encompasses 15,300 acres of the Jenny Creek watershed and overlays deer winter range. The elk management area overlays part of the LSR (see Map 2-9).

When consistent with other higher priority LSR objectives, improve elk habitat conditions. Keep the elk population in balance with deer use on the winter range.

Desired Condition

The desired condition is to have elk numbers in balance with deer numbers and available forage so that deer are not displaced from the winter range and habitat conditions are not degraded.

- Follow recommendations for deer winter range.
- Monitor the elk population.
- Keep elk populations in balance with deer populations and deer forage needs.

Cascade Siskiyou Ecological Emphasis Area

The Cascade Siskiyou Ecological Emphasis Area (CSEEA) was established in the 1995 RMP/ROD primarily because of its unique, diverse ecological and biological characteristics. The landscape being analyzed for the CSEEA covers the Jenny Creek LSR and that analysis area was used as a basis for many of the LSR base maps.

Desire Condition

Manage the CSEEA to maintain, protect, restore and enhance relevant and important cultural, biological and ecological resource values.

CHAPTER 4

MANAGEMENT RECOMMENDATIONS

INTRODUCTION

Management activities within the Jenny Creek LSR must be consistent with the objectives, policies, standards and guidelines set for these lands. LSRs have been established by the Northwest Forest Plan (NFP/ROD) and the Medford Resource Management Plan (RMP/ROD). Accomplishing the objectives will ensure the LSR moves toward the desired condition.

The overriding goal of management in LSR/MLSAs is to maintain, protect, and restore conditions of LSOG forest ecosystems, which serve as habitat for LSOG associated species in the maximum amounts sustainable through time. Inherent in meeting this goal is the contribution towards recovery of listed and petition LSOG associated species. Treatments designed to provide these habitat conditions through time support the LSR objectives. Accomplishing these goals through effective management will assist in developing and assist in retaining, restoring or enhancing LSOG habitat.

A summary of the Jenny Creek LSRA area (34,007 acres) is presented below:

Based on the 1992 habitat inventory (see Table 4-1)

- 21,037 acres (62 percent) were classified as having the capability to provide LSOG habitat. (LSOG/NSO habitat was defined by N SO NRF; definitions of habitat types are given in Table 2-5.)
- 10,525 acres (31 percent) are currently functioning as LSOG habitat.
- 10,512 acres (31 percent) are potential LSOG habitat. This acreage needs time and often management to restore and maintain desired LSOG habitat characteristics.

Based on the 1987 BLM Forest Operation Inventory (FOI)

- 30,374 acres (89 percent) were identified as "forest land" (land which is, or is capable of being at least 10 percent stocked by forest trees).
- 27,522 acres (81 percent) of the "forest land" base had a timber component of age class greater than 80 years (see Table 2-3).

Other observations

- much of the LSOG habitat is fragmented (see Map 4-1) by
 - a mosaic of small patches of grassland, shrubland and hardwood plant communities,
 - forest cover is fragmented by timber harvesting on federal land, or
 - forest cover is fragmented by land ownership pattern and associated harvesting.
- 66,743 gross acres is within the LSR boundary (including all land ownerships due to the checkerboard ownership pattern) with 53 percent is in federal ownership.

- 18,000 acres, 85 percent of the BLM potential LSOG habitat is projected to be sustained over time due to natural disturbance conditions (notably wildfire).
- Approximately 85 percent of the potential habitat, 53 percent of the LSR acreage, or 27 percent of the landscape is projected to provide sustainable LSOG habitat over time.

Table 4-1. Current condition of LSR acreage by NSO habitat (LSOG) group and ecoregion

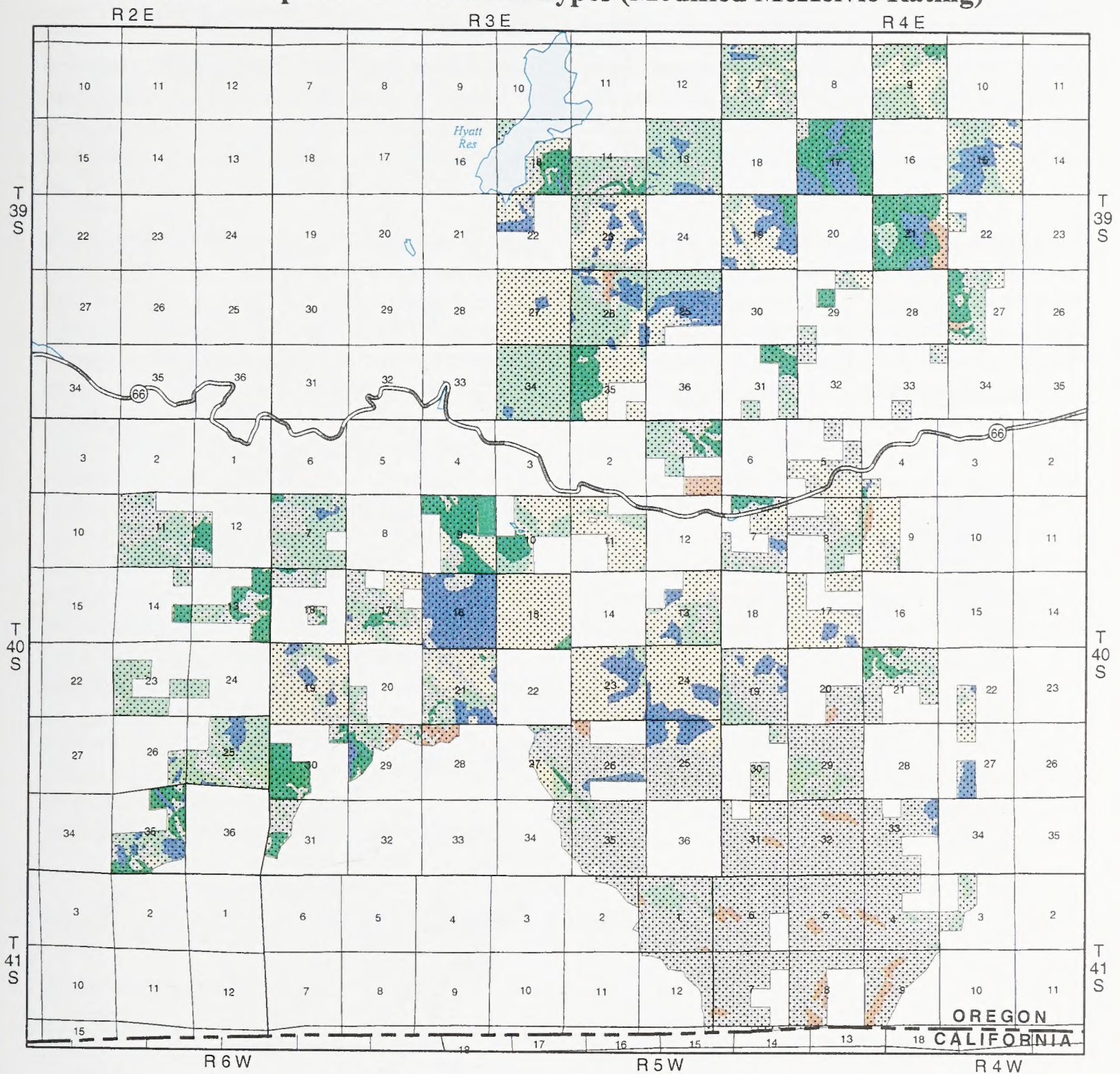
Ecoregion	Current Habitat (Type 1 & 2)	Potential Habitat (Type 3 & 5)	Dispersal with No Potential (Type 6)	No Potential Type 4	Total Acreage
Siskiyou Foothills (78b)	3,064	1,127	58	1,530	5,779
South Cascades (9i)	557	969	328	3,737	5,591
Klamath River Ridges (78g)	1,765	4,459	219	5,975	12,418
Southern Cascades (4g)	5,139	3,957	191	932	10,219
LSR Total Acres	10,525	10,512	796	12,174	34,007
Percent of LSR	31.0%	30.9%	2.3%	35.8%	100.0%
All Potential Habitat	21,037		Total Gross Acreage 66,743 BLM potential habitat 21,037 Percent of Gross Acreage 31.5% Minimum LSOG level 18,000 Percent of Gross Acreage 27.0%		
Percent of LSR	61.9%				
Long term minimum level of LSOG	18,000				
Percent of Potential	85.6%				
Percent of LSR acres	52.9%				

In order to attain or enhance functionality and promote connectivity of the LSR, it is desirable to both aggressively manage to both increase and protect the amount of LSOG/NSO suitable habitat within the current decade.

Promoting development of early and mid-seral plant communities, restoring functioning structures in disturbed (chiefly timber harvested) mid-seral to mature stands, and protecting the current and potential habitat from catastrophic/large scale wildfire are the proposed major management strategy. Active silvicultural manipulation of vegetation (habitat) and fuels (risks) is actively proposed within the first decade. (Forest stand and vegetation management of most kinds, including prescribed burning, is considered as a silvicultural treatment.)

Jenny Creek Late Successional Reserve

Northern Spotted Owl Habitat Types (Modified McKelvie Rating)



1 0 1 2 Miles
1 0 1 2 Kilometers

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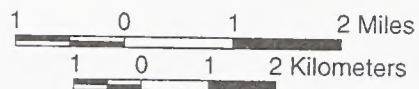
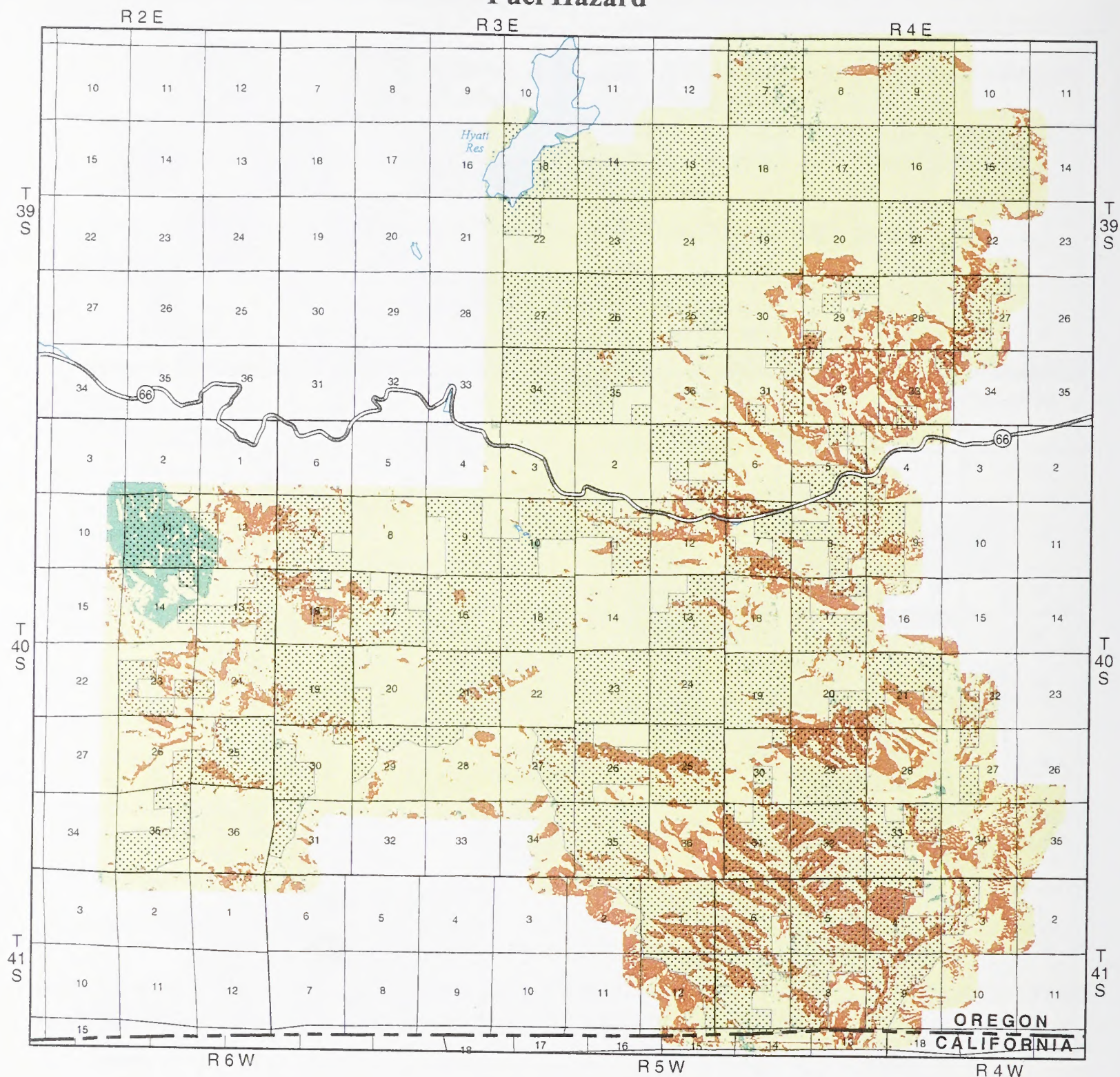
LEGEND

- Habitat 1 (3,220 acres): Nesting
- Habitat 2 (7,410 acres): Roosting/Foraging
- Habitat 3 (3,213 acres): Young Stands
- Habitat 4 (12,257 acres): No Potential
- Habitat 5 (7,591 acres): Dispersal with Potential
- Habitat 6 (800 acres): Dispersal with No Potential
- Jenny Creek Late Successional Reserve



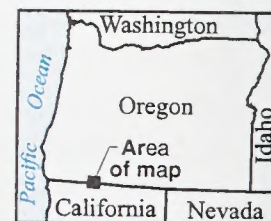
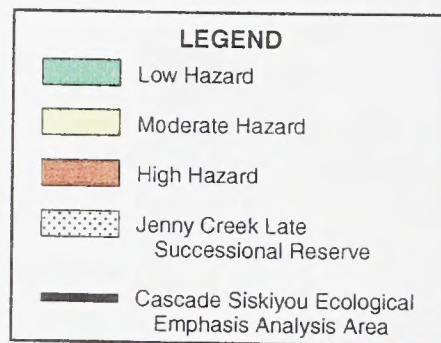
MAP 4-1

Jenny Creek Late Successional Reserve Fuel Hazard



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MAP 4-2

D03-02-00:JR

Portions of Jenny Creek LSR have conditions of elevated large scale wildfire hazard (Map 4-2) and management is proposed which goes beyond the guidelines contained in the NFP/ROD. The greatest threat to further loss and degradation of habitat for LSOG associated species is catastrophic wildfire in and around LSOG habitat. Wildfire suppression has allowed a development of fuel concentrations and the development of conifer tree fuel ladders.

The NFP/ROD noted under “Guidelines to Reduce Risk of Large-Scale Disturbances” that there is considerable risk of large-scale fire disturbances in the eastern Oregon and California Cascade Provinces and a lesser risk in the Oregon and California Klamath Provinces: “Levels of risk in those LSRs are high and may require additional measures. Consequently, management activities designed to reduce risk levels are encouraged in those LSRs even if a portion of the activities must take place in currently LSOG habitat. While risk reduction efforts should generally be focused on young stands, activities in older stands may be appropriate if: (1) the proposed management activities will clearly result in greater assurance of long-term maintenance of habitat, (2) the activities are clearly needed to reduce risks, and (3) the activities will not prevent the LSR from playing an effective role in the objectives for which they were established” (NFP/ROD C-13).

The reintroduction of low and moderate intensity fire is one of the important ecological processes within the Jenny Creek LSR that is essential for development and maintenance of LSOG and old-growth habitat, and restoring and enhancing biodiversity within the LSR and especially within special use areas. Areas where fire has the potential to do considerable damage to current LSOG are displayed in Map 4-2. High priority is given to risk reduction treatments near current habitat in adjacent young stands and nonconifer plant communities. Early intervention treatments are also projected within potential habitat areas. These areas include both disturbed mature stands and young stands where restoration and risk reduction treatments would be combined. Prescribed fire treatments may also be required in many non-forest plant communities to protect, restore or enhance their botanical integrity and promote biodiversity.

MANAGEMENT RECOMMENDATIONS

Treatment Objectives

The following are objectives that will guide the development and application of treatments within the LSR/MLSAs:

- I. Promote the continued development of LSOG habitat characteristics.**
- II. Protect existing and potential LSOG habitat from threats of habitat loss that occur inside and outside the LSR.**
- III. Promote connectivity of LSOG habitat within and adjacent to the LSR.**

- IV. Retain, protect, and restore watershed functions that result in high quality habitat for native fish and other aquatic organisms.**
- V. Manage, promote and enhance health of non-forest habitats, their plant communities and botanical integrity.**
- VI. Promote and enhance desired biological biodiversity across the LSR with emphasis to meet special land use objectives.**

Objectives, Criteria and Potential Treatments

The following are criteria, relative to each objective, to be used in setting treatment priorities within the LSR/MLSAs. Tables summarize potential treatments to be applied in order to reach the objectives. Additionally, a second set of criteria and treatments recommendations specific to NSO habitat types and Ecoregion Level IVS is presented. This latter section was prepared for those who primarily use NSO habitat for design and specific treatment recommendations. Both sets of criteria are expected to be complementary and applied during project development and implementation.

This document proposes treatment priorities within the Jenny Creek LSR and adjacent 100-acres LSRs which occur within the described Ecoregion Level IVS. Proposed treatments will be identified through watershed analysis or project level analysis. Treatments within the 100-acre NSO Activity Centers will be primarily fuel reduction activities around Habitat Types 1 and 2, and within the other habitat types, to protect the areas from moderate to high fire behavior (lethal) wildfires.

Objective I. Promote the continued development of LSOG habitat characteristics.

Criteria: For selecting treatment areas within the Jenny Creek LSR and adjacent LSR/MLSAs

1. Those ecoregions that currently lack LSOG habitat and have relatively high amounts of potential habitat.
2. Stands of mid-seral forest close to providing LSOG characteristics (30-40 years) and need enhancement or risk reduction treatments in order to reduce high hazards from expected mortality and increased fuel loading.
3. Young stands or stand components in areas generally lacking LSOG habitat and which will respond to treatment by accelerated development into LSOG habitat. Younger stands are generally considered more responsive to treatment and should be given a high priority.
4. Where recent stand replacement events have occurred and it is determined that some treatment is needed to help re-establish trees.

5. Where mid and early-successional forest is adjacent to (generally within 1/4 mile) existing LSOG , such that treating it would lead to development of larger blocks of LSOG habitat.
6. Stands that need to be treated to increase tree growth in order to accelerate the creation of LSOG habitat characteristics or to reduce moderate to high levels of insect and disease related mortality.
7. Stands within riparian areas and subwatersheds lacking LSOG habitat and/or desired structures.
8. Treatments that will decrease fragmentation and increase habitat connectivity for LSOG species.
9. Reduce fuel loading resulting from vegetation manipulation or from tree mortality in overstocked stands.

Potential Treatments: Types of treatments that would be appropriate to apply in order to meet the objective are given in Table 4-2.

Table 4-2. Potential treatments to protect, enhance, rehabilitate, and promote the continued development of LSOG characteristics

Treatment	Criteria	Criteria Notes
Reforestation, Interplanting or replanting	a, c, h	(a, c) Includes all associated reforestation activities: site preparation, planting, release, and animal control. Filling gaps, or understock areas. Following stand replacement events, conversion to or augmenting desired species components.
Density management or thinning, variable release, species selection or other improvement and hazard reduction.	b, c, d, f, g, i	Reducing density, reduce fuel ladders, favor selected species (sugar pine), or enhance understory. Those stand treatments that will accelerate growth or favor desired species or structures. May be needed prior to reintroducing prescribed fire.
Prescribed burning, hand-piling or mechanical treatment (hazard reduction)	b, e, i	Applied where fuel levels are high. May be used as a pretreatment. Used when stand structure and fuel conditions are such that fire could be used to meet objectives.

Objective II. Protect existing and potential LSOG habitat from threats of habitat loss that occur both within and outside the LSR.

Criteria: For selecting protection treatment areas within the Jenny Creek LSR and adjacent LSR/MLSAs

1. Protect NSO nesting and roosting habitat (Habitat Types 1 and 2) (note: see Table 2-4 for description of habitat types) by treating high and moderate wildfire fuel hazard areas around these habitats during the first decade.
2. Protect mid and early-seral vegetation from loss to large-scale (100-acre or larger) disturbance events.
3. Select stands of mid-seral forest that are close to providing LSOG characteristics (30-40 years) and need treatment in order to reduce future hazards from expected natural mortality and increased fuel loading.
4. Select stands within and around NSO potential habitats (Habitat Types 3 and 5) where wildfire hazard lethal to most of current and potential habitat.
5. Reduce white fir components within LSOG habitat (including around trees) at risk due to density (decreased vigor), high insect or disease risk, or fuel ladders.
6. Increase protection or habitat manipulation to areas critical for habitat connectivity for LSOG associated species.
7. Reduce fuel loading from vegetation manipulation and expected tree mortality in overstocked stands.

Potential Treatments: Types of treatments that would be appropriate to apply in order to meet this objective are listed in Table 4-3.

Table 4-3. Treatments to protect and maintain LSOG habitat from catastrophic threats, i.e., large scale disturbance events

Treatment	Criteria	Criteria Notes
Structural component (understory) density management within LSOG (hazard reduction and improvement)	a, b, d, f, h	Understory density management to reduce risk or fuel ladders, PCT ; any large trees (20"+) cut or girdled will be left as snags or CWD to meet CWD targets.
Prescribed burning and hand-piling within and outside LSOG, and mechanical treatments outside (hazard reduction and improvement)	a, b, c, e, f, g, h	Underburning within LSOG habitat and/or hazard reduction treatments across adjacent forested or non-forested areas
Vegetative manipulation adjacent to LSOG	a, c, e, f, g, h	Prescribed burning in non-forest plant communities (and mechanical treatments to reduce extreme fuel loading). Apply in adjacent areas (non-LSOG) of high fire risk.

Objective III. Promote connectivity of LSOG habitat within and adjacent to the LSR.

Criteria: For selecting treatment to promote connectivity of LSOG habitat within and adjacent to the LSR.

1. Treat areas of early and mid-seral vegetation that coincide with landscape features that are important to dispersing animals between LSRs within the LSR network
2. Treat areas of early and mid-seral vegetation that coincide with landscape features that are important to dispersing animals; such as within riparian areas.
3. Treat areas of early and mid-seral vegetation adjacent to "isolated" stands of LSOG habitat that respond to treatment in order to promote greater LSOG habitat connectivity throughout the LSR.
4. Protect habitat currently occupied by a threatened, endangered, proposed, or Survey and Manage species. Consider expected management under current or expected ownership that would be detrimental to maintenance of LSOG habitat.
5. Acquire land or land interests within the Jenny Creek LSR that contain LSOG habitat or parcels that have habitat potential parcels bordering LSR designated lands.

6. Acquire current LSOG habitat and parcels that do not border LSR designated lands.

Potential Treatments: Types of treatments that would be appropriate to apply in order to meet the connectivity objective are listed in Table 4-4.

Table 4-4. Potential treatments to promote connectivity of LSOG habitat within and adjacent to the LSR

Treatment	Criteria	Criteria Notes
Hazard related thinning	a, b, d	Young stands that are adjacent to or occur within areas rated as high potential fire hazard
Thinning (young stands)	b, c, d	Those stands that will accelerate in growth following treatment to provide dispersal or better habitat, <80 years old
Interplanting/replanting	a	Habitat Types 2, 3 and 5
MOAs, conservation easements, etc.	a, b, c, e, f	Areas of adjacent land that will promote greater connectivity and/or reduce fire hazard within LSR
Land acquisition and land interest activities	a, b, c, e, f	Areas with landscape or habitat features that may be important to dispersing animals.

Objective IV. Retain, protect, and restore watershed functions that promote high quality habitat for native fish and other aquatic organisms.

Criteria: For selecting treatment areas within the Jenny Creek LSR

1. Treat areas within the key watershed and/or areas that rank high for restoration treatments documented within watershed analyses.
2. Protect and restore riparian areas that have a high degree of LSOG connectivity within and between sub-watersheds.
3. Maintain and restore areas immediately adjacent to perennial streams that will provide aquatic or terrestrial linkages. Treat plantations within riparian reserves that will greatly accelerate the development of LSOG characteristics without adversely affecting water quality.
4. Protect riparian areas within high and moderate fire hazard potential, especially those areas where hazard potential threaten significant watershed values.
5. Reduce road densities on unstable lands or compromise hydrological functions.

6. Modify roads required for public access or hazard reduction to reduce impacts to aquatic resources.
7. Develop or update site-specific allotment management plans where livestock concentrations may be affecting streams, seeps and springs.
8. Modify or eliminate use by off highway vehicles (OHV's) from areas where they are causing short and long term negative impacts.
9. Monitor activities that are required for attainment of the Aquatic Conservation Strategy (NFP/ROD B-11) with the Key Watershed having highest priority.

Potential Treatments: Types of treatments that would be appropriate to apply in order to meet the objective are listed in Table 4-5.

Table 4-5. Potential treatments to maintain, restore, and protect stream systems and aquatic habitat that result in high quality habitat for native fish and other aquatic organisms

Treatment	Criteria	Criteria Notes
Decommission roads (hazard reduction)	d, e, f, h, i	Excess roads will be removed from system, as evaluated and identified in the Medford Transportation Management Plan. Depending upon design, soil stability, proximity to streams, maintenance levels and use the roads will be improved or decommissioned.
Thinning (habitat enhancement or hazard reduction)	a, b	Light thinning in stands that will accelerate in growth, promote desired species or stand components; reduce fuel ladders, or used where stand or site conditions will result in meeting ACS objectives. (Thinning is usually needed prior to reintroducing prescribed fire.)
Prescribed burning	b, c	Underburn-canopy manipulation, reduce white fir stocking levels, or reduce catastrophic fire risk. (Thinning is usually needed prior to reintroducing prescribed fire.)
Manage livestock grazing	b, g, i	Implement practices to protect resources as appropriate. Where objectives cannot be met, relocate livestock management and handling facilities and/or fence out sensitive areas.
Culvert installation/water bars	b, e	Replace, maintain, repair and stabilize roads and fills per Medford Road Management Plan for LSR and Key watersheds

Objective V. Manage, promote and enhance health and botanical diversity of non-forest habitat plant communities (non-LSOG potential habitat).

Note: Approximately 38% of the federal land within Jenny Creek LSR is not capable of producing LSOG habitat. Such areas periodically need treatments to protect and restore sensitive plant and animal species habitat. Protecting and improving forest woodland, shrubland, and grasslands treatments should be neutral to LSR objectives.

Criteria: For selecting treatment areas within the Jenny Creek LSR

1. High or moderate wildfire hazard on areas within one-quarter mile of suitable LSOG habitat.
2. High or moderate wildfire hazard on areas within one-quarter mile of potential LSOG habitat.
3. Grassland with long fire-absence to restore low intensity/frequent occurrence wildfire regimes.
4. Shrubland with long fire-absence to restore low intensity/frequent occurrence wildfire regimes.
5. Shrub/woodland mixes that have become nutrient/water limited.
6. High canopy woodland mixes that have become nutrient/water limited.
7. Woodlands that are being invaded by conifers and have no long term LSOG potential.
8. Have low herbaceous foliar cover within shrub/woodland plant communities.
9. Weed impacted areas.

Potential Treatments: Types of treatments that would be appropriate to apply in order to meet the objective are listed in Table 4-6.

Table 4-6. Potential treatments to manage, promote, and enhance non-forest plant communities and botanical diversity on non-forest habitat types

Treatment(s)	Criteria	Criteria Notes
Grassland maintenance burn	a, c	Grassland maintenance and protection from noxious or other weeds
Mechanical/manual treatment and/or broadcast burn	b, c, d	Restore grassland/shrubland ratio; rejuvenate shrubland.
Mechanical/manual treatment and/or broadcast burn	c, e, f	Restore nutrient cycle; restore herbaceous component.
Thin and/or underburn	d, e, f	Restore nutrient cycle; restore herbaceous component.
Thin and/or underburn	e, g	Reduce conifer invasion and improve hardwood health through thinning and light burning treatments.
Broadcast burn, followed by native grass seed application where necessary	f, h, i	Restore herbaceous component. Manage wildlife habitat.
Correctly timed burn; herbicide application; mechanical treatment; native grass seed application	g, i	Reduce weed abundance; restore native herbaceous component without damage to native species. Implement practices to control or eradicate noxious weeds.

Objective VI. Promote and enhance biodiversity across the LSR with emphasis to meet special land use objectives.

Criteria: For selecting treatment areas within the Jenny Creek LSR

1. Use any of the vegetation and habitat management criteria treatments listed above in Objectives I - V.

Potential Treatments: Types of treatments that would be appropriate to apply in order to meet the objective are summarized below (see Table 4-7).

Table 4-7. General description of Objective VI treatments

Treatment	Criteria	Criteria Notes
All treatments	All Criteria	Common theme in all ecoregions and the Ecological Emphasis Area, which is 40 percent of the Jenny Creek LSR.

Activity Design Criteria

The following discusses design criteria that will be taken into account when developing future activities from the above criteria.

A - Treatments within Young Stands less than 80 Years Old

Specific silvicultural activities in young stands were discussed in the REO memoranda "REO Review Exemption Criteria" (April 20, 1995), "Criteria to Exempt Specific Silvicultural Activities in Late-Successional Reserves and Managed Late-Successional Areas from Regional Ecosystem Office Review" (July 9, 1996) and slightly modified by an amendment (September 30, 1996). See copies of those memos Appendix N.

The proposed activities in young stands within the Jenny Creek LSR are prescribed to be consistent with criteria as listed in those memos.

Activities Listed in REO Memos

Treatments are to promote a natural species diversity appropriate to meet LSOG objectives, including hardwoods, shrubs, forbs, etc. (treatments are described in the Medford RMP/ROD):

1. Treatments to reforest and/or promote desired revegetation which include site preparation, planting, release for survival, and animal damage control measures.
2. Release efforts that promote growth of desired species and usually occurs in young forest plantations (old harvest units).
3. Density management (precommercial thinning) in young plantations and young natural early seral (seedling/sapling) stands. Desired tree criteria provide for such things as culturing individual trees specifically for large crowns and limbs, disease resistance (sugar pine rust resistance), and other mortality or habitat attributes consistent with LSR objectives.
4. Density management (commercial thinning) in early seral pole and mid-seral stands usually provides commercial produces and is risk reduction related.
 - Leave tree criteria provide for such things as culturing individual trees specifically for large crowns and limbs, disease resistance (sugar pine rust resistance), and other mortality or habitat attributes consistent with LSR objectives.
 - Cutting older trees (80+) or trees 20+ inches in diameter would be the exception, not the rule. Individual trees exceeding 20-inches dbh would not be harvested except for purpose of creating opening, providing other habitat structure such as down logs, elimination of a hazard from standing danger trees, or cutting minimal yarding corridors. Where trees

larger than 20 inches dbh are cut, they will usually be left in place to contribute toward meeting the overall CWD objective.

- Treatments include substantially varied spacing in order to provide for some very large trees as quickly as possible, maintain areas of heavy canopy closure and decadence, and encourage the growth of a variety of species appropriate to the site and the LSOG objectives.

Treatment Guidelines - Young Stands (less than 80 years old)

Recovery to LSOG forest habitat continues to be the primary goal for managing young stands and mid-seral forest stands. Treating as many acres of these as possible within the next decade will be necessary to achieve this goal. Early seral forests are projected to diminish to approximately 15 percent of the federal landscape as these stands mature. Early seral conditions on interspersed private lands and non-forest vegetation types on BLM land are expected to provide varied habitats for the LSOG associated wildlife prey base.

Most of these young stands have become established and are developing under markedly different disturbance regimes than the older stands that currently represent LSOG habitats. Because of altered natural disturbance regimes, including fire suppression, the proliferation of pathogens, accelerated fragmentation, climate change, and shifts in species composition, many of these stands are on developmental trajectories that may not provide adequate or desirable structural LSOG characteristics. The overall objective of young stand manipulation is to create residual stands that will more closely pattern historic forest development to provide structure and habitat for LSOG associated species.

Guidelines for managing young stands within the LSR are provided in Table 4-8.

Table 4-8. Young stand treatment guidelines

Deficiencies	Associated Problems	Objectives	Treatment Options	Priority
Excessive Density	<p>Slow growth.</p> <p>Reduced tree vigor.</p> <p>Increased susceptibility to insects and pathogens.</p> <p>Reduction of shade intolerant species.</p> <p>Diminished structure.</p> <p>Reduced biological diversity.</p> <p>Increased susceptibility to catastrophic fire.</p>	<p>Reduce density to: restore differential tree growth, enhance structural diversity; and improve tree vigor and stand resiliency.</p> <p>Accelerate tree growth.</p> <p>Create wolf trees</p>	<p>Variable density thinning.</p> <p>Create openings for shade intolerant species.</p> <p>Release shade intolerant species.</p>	<p>These stands are a high priority for treatment because of the ongoing loss of species diversity and horizontal structure.</p> <p>The treatment of young stands yields the greatest long-term benefit; mid-seral stands should be evaluated for loss of potential habitat.</p>
Homogenous Species Composition	<p>Loss of vertical structure.</p> <p>Inadequate habitat diversity.</p> <p>Increased susceptibility to disease and insect damage.</p> <p>Productivity loss.</p>	<p>Enhance species diversity.</p> <p>Create conditions for future recruitment of multiple species.</p> <p>Accelerate the attainment of late seral habitats.</p>	<p>Thinning to change tree species composition.</p> <p>Interplant with under-represented tree species; plant disease resistance sugar pine and restore native species.</p> <p>Thin to improve conditions for under-represented species.</p>	<p>Pine plantations are the highest priority for treatment; pole stands should also be evaluated for treatment needs.</p>

Deficiencies	Associated Problems	Objectives	Treatment Options	Priority
Excessive Levels of Forest Pathogens	<p>Rapid deterioration of desired stand attributes.</p> <p>Eliminations of sugar pine.</p> <p>Reduces future potential LSOG habitats.</p> <p>May retard development of LSOG habitats.</p>	<p>Reduce abundance, occurrence, and spread; confine or eliminate undesirable diseases.</p> <p>See Forests Insects and Disease, Chapter 2.</p>	<p>Maintain adequate density in true fir stands (laminated root rot areas).</p> <p>Reduce susceptible species beneath excessive dwarf mistletoe infestation.</p> <p>Slash sugar pine infested with blister rust.</p> <p>Treat residual stumps with borax in annosus root disease areas.</p> <p>Thinning to enhance species diversity to retard disease proliferation.</p> <p>Thinning to enhance stand vigor and resistance to pathogens.</p>	<p>Mid-seral stands where disturbance openings have occurred should be evaluated.</p> <p>Focus on areas greater than 5 acres.</p>
Inadequate Stocking	<p>Loss of future potential habitats.</p> <p>Retard late seral recovery.</p> <p>Noxious weed invasion.</p>	<p>Recover species composition.</p> <p>Reclaim growth potential.</p>	<p>Replant or interplant understocked areas.</p> <p>Provide the appropriate mixture of tree species.</p> <p>Reintroduce disease resistance sugar pine .</p>	<p>Plantation as a result of harvest, primarily in stands less than 20 years of age having highest priority for evaluation and treatment.</p> <p>Evaluate natural disturbance for planting needs.</p>

Potential Treatment Acreage - Young Forest Stands

There are 7,650 acres (FOI) of young and mid-seral stands (under 80-years of age) identified for potential treatment. These young stands acreages are displayed below in Table 4-9.

Table 4-9. Young stand acreage (stands identified as less than 80 years old)

Stand Type	Species Composition	Acres
Plantations		
<30 years	Douglas-fir	133
	White fir	59
	Ponderosa pine	336
	Jeffery pine	304
	Lodgepole pine	159
	Incense cedar	368
	Hardwoods	71
	Mixed conifer	335
	Total	1,765
Natural Stands¹		
Small Pole	White fir	259
	Douglas-fir	723
	Total	982
Mid-seral	White fir	2,127
	Douglas-fir	2,776
	Total	4,903
Total Acreage of OI Stands Less Than 80 Years of Age		
Forest Stands < 80 years of Age	Stands Identified for Potential Treatment	7,650

¹ Includes both FOI identified stands greater than 30 and less than 80 years old (1,087 acres) and significant young stand components of stands listed as greater than 80-year-old stands (4,798 acres).

Treatment Guidelines - Young Forest Stands by NSO Habitat Type and Ecoregion**Habitat Type 3 (Potential Habitat Only)*****Ecoregion: Klamath River Ridge Ecoregion (78a)***

Treatment of these stands would be designed to encourage LSOG structure over time through thinning and individual tree culture.

Proposed Treatment Level

Percent to treat within the next decade - up to 90%. Up to 1,100 acres in current decade.

Ecoregion: Siskiyou Foothills Ecoregion (78b)

Treatment of these stands would be designed to encourage LSOG structure over time through thinning and individual tree culture. Hardwoods (black oak and madrone) would be encouraged.

Proposed Treatment Level

Percent to treat within the next decade - up to 90%. Projected 375 acres in decade.

Ecoregion: Southern Cascade Slope Ecoregion (4g)

Little of this habitat type exists in this ecoregion. Most of it is young pine plantations. These will be treated under existing REO exclusion provisions and were addressed under potential treatment in young stands below. Treatment would be designed to encourage LSOG structure over time through thinning and individual tree culture.

Proposed Treatment Level

Percent to treat within the next decade - up to 90%. Up to 133 acres in current decade.

Ecoregion: Southern Cascades Ecoregion (4g)

Young plantations in this ecoregion, particularly at the higher elevations, are extremely difficult to regenerate and must be rehabilitated with pine species. CWD and snags are always deficient in these situations because of burning during site preparation after harvest.

Proposed Treatment Level

Percent to treat within the next decade - up to 90%. Projected 1,272 acres in decade.

Table 4-10. Proposed treatment level within Habitat Type 3 during the current decade

Ecoregion	Habitat Type 3 Acreage	Proposed Treatment Level within current decade
Siskiyou Foothills	416	375
Southern Cascades Slopes	148	133
Klamath River Ridges	1,222	1,100
Southern Cascades	1,413	1,272
Totals of LSOG	3,199	2,880

Habitat Type 5 (Dispersal Habitat with Potential)***All Ecoregions***

Of the 7,313 acres of Habitat Type 5, approximately 4,798 acres have young stand components within older age class stands (see table 4-9).

Recommended Treatment

- Enhance young stands 30-80 years of age per guidelines in Table 4-8. Treat areas up to of 50 percent during the first decade (2,399 acres).
- Recommendations for multistory components within older aged stands are given below in greater than 80 year old category.

Implementation Schedule - Young Stands

A high priority for treatments during the first decade would be to get as much of the young plantation establishment and thinning work accomplished as possible. Some plantations are understocked and need interplanting, others have trees too small for thinning at this time, and treatments will be prescribed in the next decade.

The second highest priority for treatment would be to get as much of the high priority fuels hazard reduction work accomplished in conjunction with thinning treatments listed above in Habitat Type 5. The areas identified as high priority for fuels reduction work are described in the Hazard Reduction section (later in this chapter), and include lands in all habitat types.

B - Proposed Treatments in Stands Greater than 80 Years Old

Current Condition

This section addresses treatments in mid-seral natural forest stands over 80-years old and/or stands that have been significantly disturbed by timber harvest, wind, insects or wildfire and have lost many LSOG attributes critical for functioning suitable NSO habitat. The following Table 4-11, based on the 1992 habitat inventory, displays the LSOG by all habitat types (shaded acreage stands that are greater than 80 years old).

Table 4-11. Current LSOG habitat and disturbance condition

Current Habitat Status	Acreage	Percent of current and potential LSOG NSO Habitat
LSOG Unentered <i>Habitat Types 1 and 2</i>	4,000	19%
LSOG with harvest history <i>Habitat Types 1 and 2</i>	6,525	31%
Older stands with harvest history and lack adequate habitat attributes <i>Habitat Type 5</i>	7,313	35%
Young stands > 30 yrs and < 80 yrs <i>Habitat Type 3</i>	1,439	7%
Plantation < 30 yrs <i>Habitat Type 3</i>	1,760	8%
Current and Potential NSO Habitat	21,037	100%

1. Approximately 17,037 acres (81 percent) of the LSR forest habitat has a history of some level of timber harvesting. Most of the timber harvest consisted of partial cutting, that is, mortality salvage, 1st stage of three-stage shelterwood, or overstory removals. Regeneration harvesting (clearcutting and 2nd or 3rd stage shelterwood) resulting in plantation occurred on approximately 8% (1760 acres) of the LSOG habitat capable lands.
2. Of the 7,313 acres of Habitat 5, 4,798 (66%) are projected to be treated as young stands. The remaining 2,515 acres (34%) are stands over 80 years old and need to be restored through time and/or some form of habitat manipulation to provide adequate LSOG habitat characteristics.
3. Most Habitat Types 1 and 2 LSOG stands are generally over 200 years old with the average tree stem diameter being 18-36 inches. Harvest entries have reduced the basal area by approximately 33-50 percent; average dbh has decreased and the remaining canopy cover generally varies from 20-70 percent. Stand recovery has been slow, given the dry nature of

the Jenny Creek LSR. Therefore, gap occupancy (preferred conifer species regeneration) and canopy recovery has been inadequate. Individual large tree response to release has been generally good (Tappiener, Sensenig and Russell pers. com. 1997).

4. Within the 4,000 acres of unentered LSOG habitat, approximately 1,600 acres (25 percent) are NSO activity centers. These stands are well stocked with few gaps (90-100 percent canopy cover) and have an understory of predominantly white fir that has developed in the absence of fire. Average stand age and tree size is greater than in the partially cut stands and pole size white fir occupy and contribute to a significant vertical canopy structure.

Either through wildfire control or harvest, the composition of overstory species has been shifting from Douglas-fir, sugar and ponderosa pine, and incense cedar toward a higher white fir percentage. Additionally, a dense understory of small white fir have filled gaps created by harvesting, disease, windfall and other disturbance factors, and stands are shifting toward less stability and fire resistance.

Some form of intervention is generally needed to protect, maintain or enhance stands on a trajectory towards recovery by the following actions:

- Creating a favorable situation for improved vertical and horizontal canopy structure, pre-fire suppression species composition, and gap occupancy.
- Increasing patch size to protect un-entered stands and existing owl cores adjacent to entered stands.
- Creating snags and CWD where deficient.
- Removing ladder fuels adjacent to large trees and reducing fire hazard.
- Selecting for vigorous long-term stand components by encouraging large trees of preferred species, size, and vigor.

Treatments are considered site specific treatments and before treatments can be implemented they will require a Medford RMP/ROD amendment. Early projects removing material over 20" diameter would remain subject to NFP Regional Ecosystem Office (REO) project review. When a track record has been established we expect to request exemption for specific treatments.

The general recommended treatment guidelines listed below are intended as standards and guidelines to be followed during the planning of projects in this LSR.

Treatment Guidelines/Design Criteria

1. Previously entered stands would have a higher priority for treatment than unentered stands. Entered and unentered stands will receive stand exams and inventories at a level that will provide valid statistical baseline data for long-term effectiveness and validation monitoring (see Monitoring Plan, Chapter 5).

Previously unentered stands proposed for treatment that fall within the provincial home range of NSOs (1.2 mile radius) will be evaluated for the following prior to treatment:

- known owl use,
 - proximity of the stand to the 100-acre owl cores,
 - current stand structure and suitability, and
 - proposed post treatment stand structure.
2. Baseline data gathering will be used to determine stand complexity and anticipated short and long term structural responses to treatment. Stands not selected for treatment will be monitored over time as well.
 3. Fuels analysis will be used to determine catastrophic risks or prescribed burning needs and its relationship to white fir stocking controls, CWD, vertical structure, and the vigor of the remaining trees.
 4. Large trees will be released to maintain vigor and regeneration potential.
 5. Stands will be examined for overstocking.
 6. Maximum timber harvest diameter limits is set at trees over 20 inches dbh. Occasionally larger trees may be cut but in most cases will leave them as snags/CWD to meet target levels. Larger green trees removed will be a rare exception.

Standards and Guidelines

1. Treatments will be designed to increase or maintain large tree vigor and to maintain large cohorts for the long-term within the stand and on the landscape, while reducing the risk of large scale losses to fire, insects, and disease.
2. Gaps (less than 1/4 acre) will be created around and adjacent to pines for regeneration opportunities, particularly in Habitat Types 1 and 2. Blister rust resistant sugar pine seedlings will be used when planting is necessary because blister rust has greatly reduced the pole, sapling, and seedling component in natural stands. Large white fir may be harvested in previously entered or unentered stands where they compete with sugar pine. Thinning will emphasize retaining and enhancing the existing pine components and promoting opportunities for pine regeneration while retaining adequate canopy cover throughout the stands treated.
3. Salvage activity will receive the same degree of monitoring, inventory, and treatment analysis as thinning activities. Salvage activity will conform to NFP/ROD standards. The largest trees available will be reserved for snags and CWD and meet target standards.

4. To promote stand diversity and structure:
 - Twenty percent or more of any stand being treated will remain as untreated patches.
 - Gaps (less than 1/4 acre) around individual or groups of large pines may be created; except within NSO activity centers.
 - Thinning will be conducted in a manner that varies tree spacing with approximately 10% of the areas left unthinned and 10% widely spaced. Canopy layers should not be wholly removed when thinning from below.
 - Green trees may be snagged or felled and left where CWD is below the standards and guidelines discussed in the section below.
 - Only thinning from below, prescribed underburns, and large pine release would be attempted in owl cores or unentered old-growth, and only if the cores exhibit overstocking of understory white fir.
5. See ecoregion specific habitat type recommendations below.

Treatment Recommendation Acreage and Implementation by Ecoregion and NSO Habitat Type

Ecoregion: Klamath River Ridge Ecoregion (78a)

Habitat Type 1: Nesting

Description

Mixed Conifer Forest stands with LSOG old-growth character are unentered or lightly entered. Two or three age classes are prominent within the multilayered stand. White fir occupies most of the understory in the form of intermediate and suppressed trees. The overstory is primarily large, old sugar pine, ponderosa pine and Douglas-fir. Some larger white fir are found, but are generally smaller and younger than the other species. Douglas-fir dwarf mistletoe is present. Coarse woody debris and snags are not generally lacking although class 1 and 2 snags and coarse woody debris may be low due to the predominance of white fir which rots quickly.

Objectives

Maintain nesting function while reducing risks to stand from fire and insects. Maintain large tree component.

Recommended Treatment

Suppressed understory (0"-7" dbh classes) would be thinned to remove an acceptable portion of small tree stocking while continuing to maintain diverse stand structure. Douglas-fir with dwarf mistletoe would be left. Some large sized trees would be girdled or dropped where CWD and snags are deficient and where they compete with overstory trees (particularly pine).

This would be done to increase individual tree vigor and to reduce competition to residual trees. Gaps for pine reproduction would not be created. Canopy would be maintained at existing levels. Light underburning may occur, but is not a priority in the first decade. Piling slash (small material only) and burning some or all piles would be an option.

Proposed Treatment Level

Percent to treat within the next decade - less than 1%. Zero acres in current decade.

Table 4-12. Summary of first decade stand treatment guidelines and area controls guidelines given by habitat type and ecoregion

Ecoregion	Habitat Type 1	Habitat Type 2	Habitat Type 3	Habitat Type 4	Habitat Type 5	Habitat Type 6
All	Protect from external fire threat. Minimal internal treatment.	Protect from external fire threat. Minimal internal treatment	Treat as much as possible. Inside owl home ranges higher priority than outside.	Treat as much as possible within one quarter mile of LSOG habitat. Subject to area controls (40% of each ecoregion)	Treat as much as possible up to area control no more than 50% of the Habitat Type 5. Treatment to canopy closure reduction treatment in first decade. No area control constraints on other treatments.	Treat as much as possible within one quarter mile of LSOG habitat subject to area controls of 40% of each ecoregion.
Klamath River Ridges / South Cascade Slopes			Highest priority			
South Cascades		Treat less than 20% of acres in the 1st decade. No treatment in 100-acre core areas.	Lowest priority for this habitat type			
Siskiyou Foothills		Treat less than 20% of LSR acres in the 1st decade. No treatment in 100-acre core areas.	Medium priority for this habitat type			

Habitat Type 2: Roosting/Foraging**Description**

Most mixed conifer stands have been entered, a few have not. LSOG characteristics are present in varying amounts. Gaps exist where large trees have been removed. White fir most commonly fills gaps to the exclusion of pine. Large trees are still present in these stands, however, Quadratic Mean Diameter and stand age is less than in Habitat Type 1. Many residual trees present are over 80 years old and often exceed 250 years of age. Canopy closure has been reduced. Canopy may or may not be single layer, but vertical forest structure is reduced and is more open and discontinuous than in un-entered stands. White fir grow around residual old-growth conifers. Sugar and ponderosa pine vigor is decreased due to white fir competition. Snags and CWD are often deficient due to past logging and yarding practices.

Objectives

Maintain roost/forage functions. Maintain tree vigor. Encourage development of the large tree component. Reduce risk of stand loss to fire and insects. Maintain canopy closure at 60% or greater.

Recommended Treatment

Thin from below to maintain the residual large tree component and reduce risk of individual pine trees. Thin predominantly white fir trees 100 years or less in age and 20 inches or less in diameter. Favor pine species, incense cedar and Douglas-fir over white fir. Some Douglas-fir with dwarf mistletoe would be favored and encouraged. Commercial sized trees would be girdled or felled and left where snags and CWD are deficient. Intermediate trees of all species would be retained in the stand. Canopy closure would not go below 60% and increase over time. Clumps of small trees in existing canopy gaps would be thinned to increase growth and hasten canopy closure. Sugar pine would be planted in suitable canopy gaps to encourage its presence in the stand. Underburning or slash piling would be an option for habitat protection.

Proposed Treatment Level

Percent to treat within the next decade - less than 1%. Zero acres in current decade.

Habitat Type 5: Dispersal Habitat with LSOG Potential**Description**

Many of these stands were more heavily thinned and often are a result of shelterwood cuts or multiple entries. Some are younger stands or are stocked at lower levels due to disturbance, poor soils or low site forest lands. Canopy cover is limited, little layering exists and understory stocking levels are often poor. CWD and snags are almost always deficient.

Objectives

Develop forest stands with LSOG characteristics. Accelerate stand development to encourage the creation of roosting/foraging habitat. Encourage development of vigorous open grown trees that maintain dispersal functions.

Recommended Treatments

Light thinning of smaller sized trees (less than 20" dbh), particularly white fir, would increase residual tree growth. Intermediate tree growth would be encouraged. Individual tree culturing would be performed particularly in the case of individual pines. Larger sized trees that are selected for cutting would usually be left on site as snags. Planting of gaps would be standard to increase the pine component and canopy quality over time. Canopy closure would be maintained at 40%, and preferably increased over time.

Proposed Treatment Level

Percent to treat within the next decade - up to 65%. Up to 2,100 acres in current decade.

Table 4-13. Proposed treatment level within current decade by LSOG/NSO habitat types within the Klamath River Ridges Ecoregion

Klamath River Ridges	Acreage in Category	Proposed Treatment Level within current decade
NSO Habitat Type 1	508	0
NSO Habitat Type 2	1,257	0
NSO Habitat Type 3	1,222	1,100
NSO Habitat Type 5	3,237	2,100
Totals of LSOG	6,224	3,200

Ecoregion: Siskiyou Foothills Ecoregion (78b)

Habitat Type 1: Nesting**Description**

Mixed conifer forest stands are unentered or lightly entered. Two or three size and age classes are found in a multistoried stand. There is a significant amount of black oak and madrone in the intermediate canopy level. Hardwoods are often overtopped by large mature conifers such as Douglas-fir, ponderosa pine and incense cedar. Few sugar pine or white fir are found in these stands although some white fir are present as seedlings and intermediate suppressed trees in the understory. Douglas-fir and incense cedar are the most common seedlings and pole sized conifers. Dwarf mistletoe is often heavy on Douglas-fir. Stands occur on steep slopes and display riparian features. CWD and snags are not generally lacking for hardwoods or conifers.

Objectives

Maintain nesting functions while reducing risks to stands from fire and insects. Maintain large trees in the stand.

Recommended Treatment

Suppressed understory conifers would be thinned from around dominant conifers and black oak in a manner so as to maintain canopy and stand structure. White fir found would be removed while maintaining the other species components. Some commercial sized trees would be girdled or dropped where they compete with dominant ponderosa pine and black oak. Residual tree vigor would be encouraged. No gaps would be created. Underburning or pile burning of slash may occur but would not be a priority this decade.

Proposed Treatment Level

Percent to treat within the next decade - less than 1%. Zero acres in current decade.

Habitat Type 2: Roosting/Foraging**Description**

Most mixed conifer stands have been entered, some have not been managed. LSOG characteristics are present in varying amounts. Gaps exist where large trees have been removed. Douglas-fir is usually filling these gaps. Dwarf mistletoe on Douglas-fir is common and sometimes heavy due to past selective logging practices that opened the stands up. Canopy closure has been reduced. Canopy is generally not single layered although forest structural diversity is reduced, more open and discontinuous than in un-entered stands. Mean diameter is less than in Habitat Type 1. Ponderosa pine and black oak vigor is decreased due to heavy stocking and competition from Douglas-fir and incense cedar. Snags and coarse woody debris are sometimes deficient due to past management practices.

Objectives

Maintain roost/forage functions. Maintain tree vigor. Encourage the development of large tree components. Reduce the risk of stand loss to fire and insects. Increase canopy closure or maintain it at 60%.

Recommended Treatments

Thinning from below would be performed to maintain the residual large tree composition of ponderosa pine and Douglas-fir. Thinning for all species would select trees less than 20" dbh. Thinning around individual black oak and subdominant pine would be accomplished to encourage vigor and development of old-growth trees. Douglas-fir with dwarf mistletoe would be favored across several size classes. Some infested trees would be removed where infection is heavy and threatens overall stand vigor. Intermediate trees of all species other than white fir would be maintained in the stand. Canopy cover would be maintained at 60% or increased above 60%. Clumps of small trees in existing canopy gaps would be thinned to increase growth and hasten canopy closure. Ponderosa pine would be planted in suitable gaps. Underburning and/or slash piling would be an option for habitat protection.

Proposed Habitat Enhancement Treatment

Percent to treat within the next decade - less than 1%. Zero acres in current decade.

Habitat Type 5: Dispersal Habitat with Potential**Description**

Many of these stands were heavily and selectively thinned. These stands are now composed of heavy brush and hardwoods as well as residual conifers. Some stands are younger in age and/or are stocked at lower levels due to disturbance or poor soils. Residual Douglas-fir with dwarf mistletoe were often left in the stand. Canopy cover is limited, generally less than 40% and little layering exists at present. Coarse woody debris and snag numbers are usually limited.

Objectives

Maintain dispersal function while encouraging development of large trees. Increase or maintain canopy cover and structural diversity. Reduce risks to insects and catastrophic fires.

Recommended Treatments

Thinning of small conifers, hardwoods and brush would encourage overall stand vigor. Individual tree culturing of ponderosa pine and black oak would be accomplished by thinning Douglas-fir from below. Canopy cover would always be maintained at or above 40%. Any larger trees selected for cutting would remain on site either as snags or CWD. Planting existing canopy gaps with ponderosa pine would be done to increase the stand pine component. Most dwarf mistletoe infected Douglas-fir would remain.

Proposed Treatment Level

Percent to treat within the next decade - up to 40%. 284 acres in current decade.

See Table 4-14 for summary of proposed treatment level within the current decade within the Siskiyou Foothills Region.

Ecoregion: Southern Cascades Ecoregion (4g)**Habitat Type 1: Nesting****Description**

Forest stands are lightly entered or un-entered. The higher elevation stands are composed of almost pure, large old white fir stands. Gaps are common where *Phellinus weirii* has had a historical presence. White fir is filling these gaps as very dense clumps. Many white fir stands are associated with wet alpine meadows. Therefore, patch size may be smaller. Stand density is particularly high in association with meadow edges. White fir stands here have a greater tendency to be even-aged, single canopy where *Phellinus* is absent. At lower elevations individual large, sugar pine and ponderosa pine are older than white fir because they have remained as a stand component due to the pine's resistance to various root rots. Here sugar pine and ponderosa pine sometimes fills the canopy gaps along with incense cedar as white fir mortality occurs in root rot pockets. Douglas-fir trees are present as well. Douglas-fir dwarf mistletoe is not a factor as in the other ecoregions. Stocking density tends to be greater in the Southern Cascades than in the Klamath Ecoregion. CWD and snags are

present in sufficient quantities. *Phellinus weirii* infection creates many snags and much coarse woody debris, although it is sometimes short lived.

Objectives

Maintain nesting functions while reducing competition on larger trees.

Recommended Treatment

No thinning or other intervention would be proposed in the high elevation pure white fir stands. Lower elevation stands with a pine and Douglas-fir component would be thinned lightly around large old growth trees. Trees thinned would be less than 20" in diameter. Any commercial size tree would be girdled or fallen and left in place for snags and CWD. White fir would be the only species cut in these instances. Light underburning and pile burning would be low priority option.

Proposed Treatment Level

Percent to treat within the next decade - less than 1%. Zero acres in current decade.

Table 4-14. Proposed treatment level within current decade by LSOG/NSO habitat types within the Siskiyou Foothills Ecoregion

Siskiyou Foothills	Acreage in Category	Proposed Treatment Level within current decade
NSO Habitat Type 1	949	0
NSO Habitat Type 2	2,115	0
NSO Habitat Type 3	416	375
NSO Habitat Type 5	711	284
Totals of LSOG	4,191	659

Habitat Type 2: Roosting/Foraging

Description

Most stands have been entered, or are younger in age and have smaller trees than Habitat Type 1 stands. Pure white fir stands that have been opened up by thinning suffer from wind throw and pockets of *Phellinus*. Additionally, they often have become infected with *Annosus* root rot through stumps from previous thinnings. Over time, all of these factors contribute to decreasing stocking levels and canopy cover. Seedling and intermediate tree stocking varies and depends on gap size. Understory stocking levels can be minimal. Intermediate canopy is usually not well developed.

Multi-species stands which includes sugar pine, incense cedar and white fir are more resilient and show some recovery with release of root rot resistant species after harvest. Multi-species composition stands tend to have more developed canopy levels. Stands are approaching 60%

canopy cover. Canopy gaps are often filled with root rot resistant species. CWD and snags are sometimes deficient in numbers.

Objectives

Maintain roost/forage function while encouraging development of leave trees. Manage root rots to an acceptable level. Maintain canopy of at least 60%.

Recommended Treatments

Little or no thinning of trees greater than 20" dbh would be recommended other than around root rot resistant species in order to reduce risk in stands dominated by white fir. Planting of root rot resistant species would occur in canopy gaps when these stands open up due to root rot infection and windthrow. Thinning of existing reproduction would occur in gaps in order to hasten canopy closure. These stands would always be managed to maintain maximum cover. CWD would be left in canopy gaps for cover to encourage and protect natural or planted seedling growth.

Proposed Treatment Level

Percent to treat within the next decade - up to 20%. 712 acres treatment in current decade.

Habitat Type 5: Dispersal Habitat with Potential**Description**

Forest stands have often been thinned as shelterwoods. Some stands may be open grown, intertwined with meadows or exhibit naturally low stocking levels. Stands are open with little canopy development and have few seedlings due to exposure on cold, harsh sites even though canopy cover is greater than 40%. Root rots are a problem, particularly in stands dominated by white fir. Windfall is common and stands decrease in stocking levels, canopy closure, and complexity over time especially in white fir dominated stands. CWD and snags are deficient due to past logging, yarding, and burning practices.

Objectives

Maintain dispersal functions while encouraging growth of open full-crown trees. Manage root rot to acceptable levels.

Recommended Treatments

Light thinning of white fir clumps in the open and under root rot resistant species would occur. Planting of species other than white fir would be done in suitable canopy gaps. Any commercial sized trees to be marked for "harvest" would be girdled or fallen into canopy gaps for cover for seedlings and wildlife where CWD and snags do not meet targets.

Proposed Treatment Level

Percent to treat within the next decade - up to 40%. 1,018 acres in current decade.

See Table 4-15 for summary of proposed treatment level within the current decade within the Southern Cascades Ecoregion.

Table 4-15. Proposed treatment level within current decade by LSOG/NSO habitat types within the Southern Cascades Ecoregion

Southern Cascades	Acreage in Category	Proposed Treatment Level within current decade
NSO Habitat Type 1	1,580	0
NSO Habitat Type 2	3,559	712
NSO Habitat Type 3	1,413	1,272
NSO Habitat Type 5	2,544	1,018
Totals of LSOG	9,096	3,002

Ecoregion: Southern Cascades Slope Ecoregion (9i)

Habitat Type 1: Nesting

Description

Stands are ponderosa pine dominated. A mixture of white fir and Douglas-fir understory has developed in the absence of fire. These stands are located on the lee side of the Cascades. They are on very dry sites on generally flat terrain.

Objectives

Maintain nesting function while reducing risks to stand from fire and insects. Maintain large tree component.

Recommended Treatment

Very little of this habitat is found at present. The only treatment recommended would be a light pre-commercial tree thinning from below and/or underburning in order to maintain ponderosa pine vigor.

Proposed Treatment Level

Percent to treat within the next decade - less than 1%. Zero acres in current decade.

Habitat Type 2: Roosting/Foraging

Description

Ponderosa pine dominated stands occur on the lee side of the Cascades. The sites are flat and dry. Douglas-fir and white fir understory has developed in the absence of fire. Overall the stands tend to be more open grown than forest stands in the other ecoregions. Tree diameter is less than in Habitat Type 1. Most of these stands have been entered, a few have not.

Canopy closure has been reduced. The canopy may or may not be single layer, however forest cover has been reduced and may or may not be more open and discontinuous than in un-entered stands. CWD and snags are generally deficient due to past logging and yarding practices.

Objectives

Maintain roost/forage functions. Maintain tree vigor. Encourage development of the large tree component. Reduce risk of stand loss to fire and insects. Maintain canopy closure at 60% or increase it.

Recommended Treatment

Thinning from below will be done to maintain the large tree component in the stand. It is expected that these stands will be more open than similar stands in the other ecoregions given that these are ponderosa pine dominated stands. Generally, white fir and Douglas-fir less than 16" in diameter and less than 100 years of age will be thinned. Ponderosa pine, sugar pine and incense cedar will be favored. Existing tree clumps in canopy gaps will be thinned to increase their growth and to hasten canopy closure. Ponderosa pine will be planted or encouraged to grow whenever possible. Commercial sized trees would be girdled or felled and left where snags and CWD are deficient. Acceptable levels will be as in the Klamath River Ridges Ecoregion. Underburning or slash piling would be an option for habitat protection and risk reduction.

Proposed Treatment Level

Percent to treat within the next decade - up to 15%. Up to 69 acres in current decade.

Habitat Type 5: Dispersal Habitat with Potential**Description**

Many of these stands are heavily thinned and some were selectively cut. A few are younger stands or are stocked at lower levels due to disturbance, poor soils or are intermixed with natural meadows. Stands are open and canopy cover is generally limited, little layering exists and stocking levels are poor. CWD and snags are often deficient.

Objectives

Develop forest stands with LSOG characteristics. These stands would become roosting/foraging habitat. Encourage development of vigorous open grown trees that maintain dispersal functions.

Recommended Treatments

Stand character would be shifted more towards ponderosa pine. Light thinning of understory trees generally less than 20" in diameter would increase tree growth and vigor. Canopy gaps would sometimes result. Groups of pine in different age classes would be encouraged. Underburning and/or piling would be options. Canopy closure would be maintained at or above 40% encouraged in order to maintain diverse structure in ponderosa pine stands.

Multistoried canopies would be encouraged and would have a full crowned pine character. Entries would favor a number of trees in several Dunning's pine classes (Dunning, 1928). Larger trees selected for cutting would be left on site where snags or CWD are deficient.

Proposed Treatment Level

Percent to treat within the next decade - up to 40%. Up to 328 acres in current decade.

See Table 4-16 for summary of proposed treatment level within the current decade within the South Cascades Ecoregion.

Table 4-16. Proposed treatment level within current decade by LSOG/NSO habitat types within the South Cascade Slopes Ecoregion

South Cascade Slopes	Acreage in Category	Proposed Treatment Level within current decade
NSO Habitat Type 1	95	0
NSO Habitat Type 2	462	69
NSO Habitat Type 3	148	133
NSO Habitat Type 5	821	328
Totals of LSOG	1,526	530

C - Snags and Coarse Woody Debris

Snags

Target densities (snags per acre) for each size class were developed for each of the four ecoregions. See tables 4-17 through 4-19 for snag density, size and species targets for each ecoregion.

Table 4-17. Siskiyou Foothills Ecoregion observed snags and snag density targets (based on 5 sample sites)

Size Class (DBH)	Observed Mean Snags/ Minimum Level (per acre)	Target Density Range (per acre)
8-15.9	4.58	4.58
16-23.9	1.08	2.36
24-31.9	0.32	.9
32+	0.48	1.3
All	6.46	
16+	1.88	4.54

Mean snags per acre 6.6 (n = 5 sites)

Sample standard deviation of snag density 3.80 (n = 5 sites)

Snag density at most snag-rich site 10.6 per acre

Snag density at snag-poorest site 1.8 per acre

Table 4-18. South Cascades Ecoregion observed snags and snag density targets (based on 5 sample sites)

Size Class (DBH)	Observed Mean Snags/ Minimum Level (per acre)	Target Density Range (per acre)
8-15.9	7.96	7.96
16-23.9	2.72	5.16
24-31.9	1.94	4.21
32+	2.52	4.54
All	15.14	
16+	7.18	13.91

Mean snags per acre 15.20 (n = 5 sites)

Sample standard deviation of snag density 5.73 (n = 5 sites)

Snag density at most snag-rich site 24.5 per acre

Snag density at snag-poorest site 10.1 per acre

Table 4-19. Klamath River Ridges Ecoregion* observed snags and snag density targets (based on 5 sample sites)

Size Class (DBH)	Observed Mean Snags/ Minimum Level (per acre)	Target Density Range (per acre)
8-15.9	7.02	7.02
16-23.9	3.74	6.06
24-31.9	2.4	4.47
32+	0.76	1.96
All	13.92	
16+	6.9	12.49

Mean snags per acre 14.10 (n = 5 sites)

Sample standard deviation of snag density 2.94 (n = 5 sites)

Snag density at most snag-rich site 17.2 per acre

Snag density at snag-poorest site 9.7 per acre

* Snag density targets in this table also apply to the South Cascade Slopes Ecoregion.

Applying the Target Density Figures

Target snag densities are to be applied on a unit by unit basis whenever management activities which may affect current snag densities, and/or future snag recruitment potential are proposed. Density management activities in the form of understory thinnings, plantation thinnings, large tree culturing, small group selections, and underburning are the activities that are most likely to affect current and future snag numbers. As part of these activities, some trees would be considered for removal from stands in order to meet stand protection and fuels management objectives. Before these trees are actually selected for removal, an analysis would be performed to determine how many would be necessary to retain in order to meet current and future snag and CWD targets. Only material in excess of current and future snag, CWD and canopy closure needs would be removed from the site. Projected rates of snag decay and recruitment would be used in determining if and how many green trees would need to be left for future snag and CWD needs.

Stands proposed for treatments would be subject to a 2.5% sample of snags. For example, a 44 acre unit would be sampled with 1.1 acres of snag transect. The pre-treatment densities observed would be compared to target snag densities for the ecoregion. Hazard trees along open roads would be exempt from the snag density targets. They could be felled as necessary for safety purposes.

Prescriptions for selecting treatments under three situations as follows:

- Early and mid successional stands that are below snag target levels
- LSOG stands which are currently below snag target levels.
- LSOG stands which are currently at or above the snag target levels.

Situation #1 -- No activities should be undertaken which would preclude or retard the development of sufficient numbers of snags to meet and maintain the target levels and simultaneously maintain canopy closure target levels through time. Trees identified for possible removal would be designated for snag creation until snag size class targets are met. Material (trees) excess to current and future snag, CWD and canopy closure needs could be removed from the site.

Situation #2 -- Any activity that would remove trees from the site would be designed to provide for the creation of sufficient numbers of snags to meet the target levels as an integral component of the treatment. No activities would be undertaken which would preclude the recruitment of sufficient numbers of snags to maintain the target levels and simultaneously maintain sufficient canopy closure through time. Only material excess to current and future snag, CWD and canopy closure needs could be removed from the site.

Situation #3 -- No activities would be undertaken which would reduce the existing snag levels below the target levels. No activities would be undertaken which would preclude the recruitment of sufficient numbers of snags to maintain the target levels and simultaneously maintain sufficient canopy closure through time.

Snag Attribute Criteria

Short snags with a height (in feet) that is less than $\frac{1}{2}$ the dbh (in inches) should not be counted. For example:

Short snag A is 20 inches in diameter and 35 feet tall and counts.

Short snag B is 20 inches in diameter and 8 feet tall and does not count.

Hollow or green cull trees could be counted as snags as long as they don't make up more than 1/4 of snags on the site. Existing large snags could be substituted for smaller snags when trying to meet size class targets. However, this substitution does not work in reverse. Two "extra" 15" size class snags could not substitute for a 30" class snag. If a stand is deficient in a size class, no snags in that size class would be removed from the stand unless a suitable number of green trees are going to be made into snags as part of the project. These green trees could only be made into snags if doing so does not bring the canopy closure down below the target level for the stand.

Worker safety must be considered when planning and implementing projects on the ground. Accordingly, in thinning operations, no trees should be marked to cut adjacent to snags that would require the snag to be felled as a hazard tree. Also during understory thinning, "leave islands" would be left around all hazardous snags.

Salvage activities would occur only when consistent with the LSR 10+ acre salvage guidelines in the NFP/ROD (pg. C-13), and as amended by Regional Ecosystem Office directives.

Snag species mix typical of 16"+ diameter by ecoregion is given in Tables 2-10 to 2-14.

Coarse Woody Debris (Down Wood)

Retain all CWD on site in stands that are to be treated consistent with target below and hazard reduction criteria in Section below. Based on the current/observed information, target levels for decay class 1 and 2 coarse wood in the respective ecoregions were prepared and summarized in Table 4-20. Snag numbers are shown to indicate future contribution to the down coarse woody debris.

Density management treatments will use the observed levels as a minimum or threshold level. If this minimum amount of wood is not present pre-treatment, or is not left post-marking, the two largest trees marked for cutting, or two average leave trees will be made into snags and left in addition to the target snag level as future CWD. This will ensure that wood contributed to the forest floor ecosystem is adequate to meet natural habitat needs. Material under 3" is not considered CWD. Limbs less than 3" diameter and tops smaller than 3" diameter can be removed for fuel hazard reduction. Material piled adjacent to or on the logs should not be burned.

The target prescription density on lands where commercial harvest occurs will be relatively higher than the observed level. This target level given in the table below is the desired level for mature stands. Stands should be monitored following harvest to determine if the target levels and the desired species mix is developing. In most cases the higher numbers of snag or blowdown will provide the desired down woody debris over time. If, after five years following stand manipulation the CWD levels, averaged over a 40 acre area basis, are not reaching the target levels, additional trees within the larger average diameter range will be "snagged" to provide the target CWD habitat level.

Following salvage operations after large scale disturbances there is a need to retain a high level of snags and down woody debris to carry the new stand from the re-initiation stage through maturity when CWD will again develop naturally. The snag numbers and down woody debris will meet or exceed the target levels per acre from the largest diameters available on site.

Larger CWD is important for the development and function of forests; and because large diameter pieces of CWD have more durable heartwood than smaller pieces, they last longer. Large logs are key habitat components for many forms of wildlife; by disrupting air flow and providing shade, they insulate and protect various forest species. We believe the specific measure of 16 inch diameter by 16 foot length as a measure is a baseline (see Appendix H for

BLM Information Bulletin No. OR-97-064 Question 3) and pieces with diameters in excess of 20 inches and volume in excess of 32 cubic feet may be “counted.”

Large diameter pieces are often shorter than 16 feet and could be removed in risk reduction operations because they don’t “count.” Based on field examination, some biologists recommend the retention of these larger diameter, but shorter length logs. If these large diameter segments provide the desired CWD form and function despite the fact that their length is shorter than the specified minimum, they may be counted toward the target piece requirement when:

- Large end diameters are greater than 30 inches and log length is greater than 10 feet;
- Log diameters are in excess of 20 inches and volume is in excess of 32 cubic feet; (see Appendix H BLM Information Bulletin No. OR-97-064 Question 3 and attached table)
- They are the largest material available for that site.

Table 4-20. Coarse woody debris; down coarse woody debris and snags target levels

Ecoregion	Observed Ave (Minimum) Coarse Wood on ground 16"dia./16'+ in decay class 1 or 2 (Ave. # pieces/acre)	Target Range Density for Coarse Wood 16"dia./16'+ in decay class 1 or 2 (Ave. # pieces/acre)	Observed Ave (Minimum) Snags 16"dia./16'+ (mean snags per acre)	Target snag level 16"dia./16'+ (Ave. per acre)
Siskiyou Foothills	1.4	2-4	1.9	4.5
Klamath River Ridges	5.2	6-8	6.9	12.5
South Cascades	4.2	5-7	7.2	13.9
South Cascade Slopes**	n/a	6-8	n/a	12.5

* Diameter is measured at the large end

** As a result of not having an adequate number of transects in the Southern Cascade Ecoregion, the target density for that ecoregion will be the same as the adjacent Klamath River Ridges Ecoregion which is similar in elevation and plant associations.

D - Hazard Reduction

Protect existing and potential LSOG habitat from threats of habitat that occur inside and outside the LSR.

The objective is to protect, restore, or maintain LSOG forests and younger forests or to reduce the likelihood of stand replacing disturbances that would result in the loss of key LSOG structure. Fuel management activities (FMA) are to minimize large scale damage to existing and potential LSOG habitat and other resource values, such as soil and water, from wildfires which may occur.

In general, the goal is to manage the average fuel conditions such that flame lengths will be <4 feet.

Recommended Conditions

Large stand replacement or high intensity fires are not desirable within the LSR. Although large, severe wildfires are estimated to be a low probability, the use of prescribed fire will help to insure that when wildfires do occur the intensities will be low to moderate. Fires with low intensities will reduce surface and ladder fuels and tree densities. Young dense stands contribute to stress and mortality of mature conifers and hardwoods.

1. Moderate intensity fires are desirable if they create small openings (less than 5 acres) which would allow for regeneration to occur and create additional snags and concentrations of down woody debris. The reintroduction of fire will enhance the regeneration of fire-dependent species and create forest structures and landscape patterns that are comparable to those developed under the more frequent fire regimes of the past particularly in the southern portion of the South Cascade Slopes and Klamath River Ridges Ecoregions. Restoring these conditions will make stands more resilient to insect infestations, disease, and catastrophic fire, thus reducing the risk of long-term ecosystem disruptions.
2. Variability of fuel conditions across the landscape is desired with some areas having high concentrations of fuel intermixed with areas of low fuel accumulations. It is reasonable to expect that heavier scattered pockets of fuels will occur on relatively cool, moist sites, such as those found on north and east tending slopes, or low on the slope adjacent to perennial riparian areas. South and west tending aspects and upper slope positions, which are typically drier and harsher, should generally contain lighter fuel loadings with fewer scattered pockets of heavy fuel.
3. Management activities that improve or maintain desirable fuel characteristics adjacent to and within the LSR will be required to achieve this goal. Fire plays an important role in the development and maintenance of vegetative diversity in fire prone ecosystems as found throughout the Jenny Creek LSR. The application of fuels management activities, combined with the use of prescribed fire, are considered appropriate management tools. In some cases, however, fire suppression will remain an essential management activity to protect resources.
4. The primary objective of the fuels management program is to allow prescribed fire to regulate forest density, species composition, and vegetation conditions. Many factors influence fire behavior and the effects fire will have on a resource. Factors which are beyond our ability to control are the location of a fire start, weather and topography. Fuels management programs focus on the factors which we have influence over such as natural and activity fuels along with vegetation. Prescribed fire and fuels management activities will meet this objective, as well as reduce the potential of large stand replacement fires. The time of year these activities occur will have varying impacts to different resources. This needs to be taken into account

when proposing fuel management activities. All burning would be done in accordance with the Oregon Smoke Management Plan.

5. To increase the effectiveness of these activities they should be implemented over large areas.
6. Chosen treatments depend on current conditions. Underburning would be the preferred treatment. Hand piling and burning before the use of underburning might be necessary due to existing fuel loadings and stand conditions. Manual treatment of ladder fuels may have to occur before the use of underburning or hand piling. Thinnings should also be used in conjunction with burning to reduce stand densities in order to minimize the possibility of stand replacement fires.

Recommended Fuels Management Treatments

1. Reduce the chance of large crown fires in LSOG habitat by reducing ladder fuels in the understory; particularly within suitable owl habitat, and surrounding habitat with moderate or high fire hazard. Although it was recognized that much of the LSR is characterized as low risk or with areas that would have low flame lengths, it must be understood that with the presence of heavy white fir ladder fuels and heavy stand densities, it could be very likely for a fire to get into the crown; possibly resulting in suitable habitat damage.
2. Use prescribed fire to manage activity fuels that remain after stand treatments. Fine fuels would be reduced where land treatments have allowed fuels to accumulate to unacceptable levels.
3. Reduce unnatural fuel loadings as a result of changed (missed) fire cycles within the previously low and moderate severity fire regime areas. Much of this area is located within the grasslands, shrublands, and woodlands.

Recommendations to Reduce Short-Term Risks

1. Potential treatments that reduce amounts of fine fuels include, prescribe burning (underburning/broadcast burning, handpiling and burning piles, and swamper burning), gross yarding, or sale of material for fuel or other purposes. Prescribed burning would be "cool" intensity that maintain soil organic matter and organisms and, when possible, should mimic the effects that naturally occurring non-catastrophic fire produce.
2. Dispersing fuels through lopping and scattering or chipping to get them closer to the ground so they can decay faster and reduce flammability
3. Reduce and/or disperse concentrations of fuels so that intense fires will not move across the landscape particularly where the risk of ignition is high such as near State Highway 66.

4. Consider closing roads near suitable habitat areas during the time of year when human ignition potential is high.

Implementation Priorities

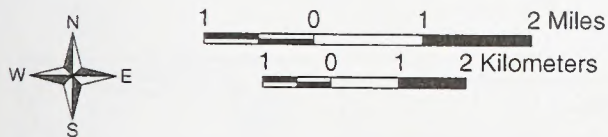
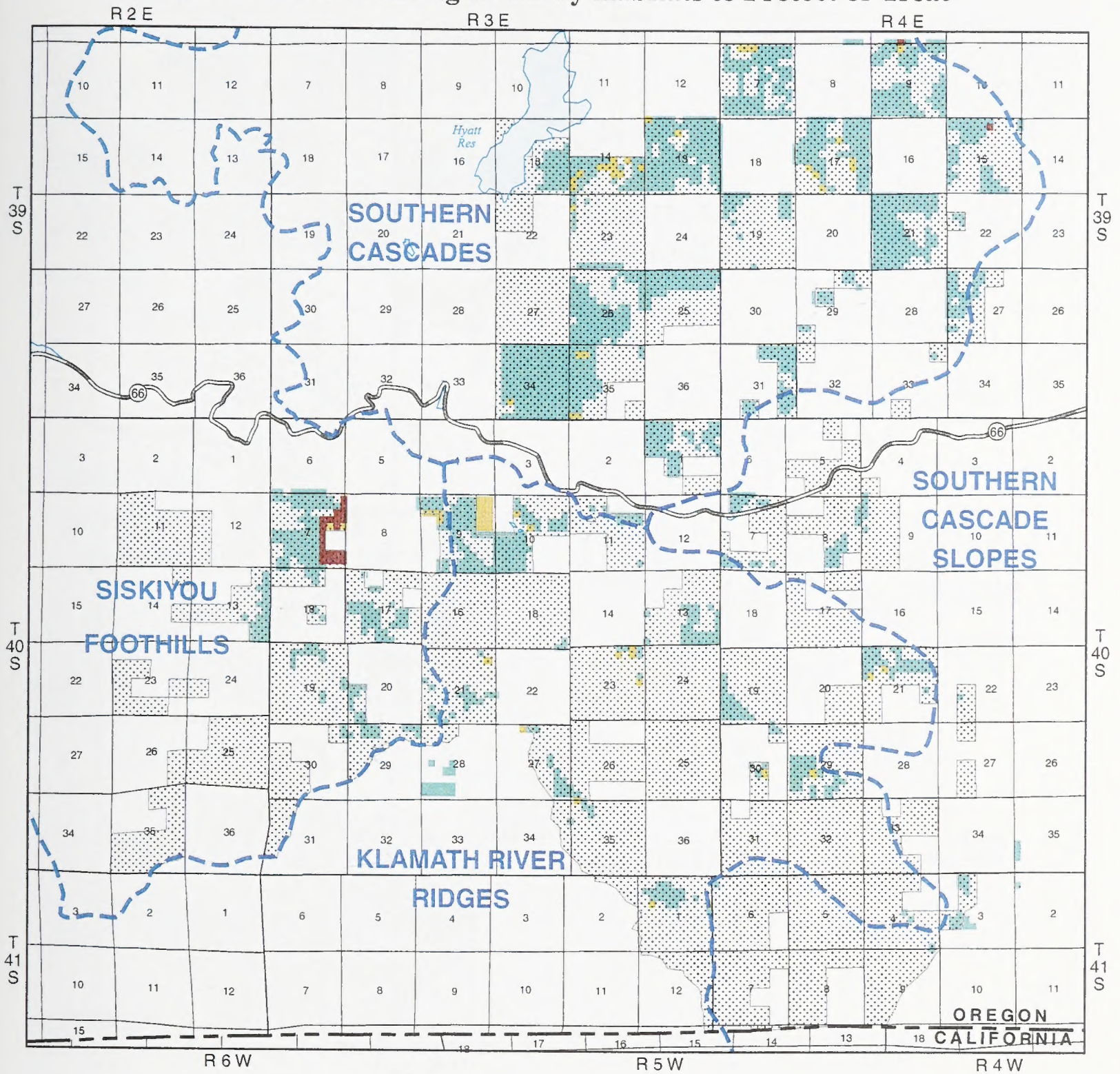
The priority for treating these areas with thinning and/or fire would be:

1. Areas are currently classified as high potential fuel fire hazard (See Map 4-3). Approximately 1,600 acres are in this category and have priority for treatment in the first decade. The prioritized treatment are:
 - Stands within 1/4 mile of Habitat Types 1 and 2 **and** where predicted flame lengths are greater than 8' in length. (approx. 17 acres)
 - Habitat Types 1 and 2 (approx. 360 acres)
 - Remaining high hazard acres (approx. 1,223 acres)
2. Habitat Types 1 and 2 where predicted flame lengths are greater than 8' in length. Approximately 129 acres are in this category, see Table 4-21 and Map 4-4.
3. Areas which have been classified as moderate hazard **and** are within 1/4 mile of Habitat Types 1 and 2 (Map 4-4). The prioritization of treatment would be:
 - Where predicted flame lengths are 4 to 8 feet in length in Habitat Types 5 and 6.
 - Habitat Type 5 (approx. 4,600 acres)
 - Habitat Type 6 (approx. 360 acres)
 - Habitat Type 4 (approx. 4,000 acres)
4. Restoration of Habitat Type 5 (dispersal with potential) management is critical to the successful functioning of the LSR. There is approximately 7,313 acres of type 5 habitat. It has the highest potential to become LSOG habitat in the near future, and currently provides dispersal habitat for NSO and other species. As a result, a considerable portion of the type 5 habitat should be treated in order to hasten the development of LSOG characteristics.

Some of the treatments proposed in type 5 stands would reduce canopy closure to some degree, but would never take it below 40% on a stand/unit basis. It is recommended that no more than 50% of type 5 habitat in the LSR be treated with canopy closure reducing treatments in the first decade. In reality, it is unlikely that funding will be available to treat enough acres to approach the 50% figure.
5. Habitat Types 1 and 2 where flame lengths are 4'-8' in lengths. Approximately **334 acres** are in this category, see Table 4-21 and Map 4-4.

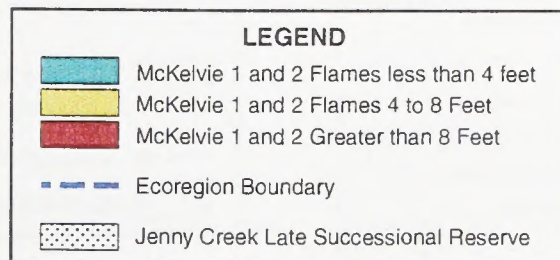
There are 826 acres of Habitat Types 1 and 2 identified by FARSITE fire behavior modeling as being at severe risk of mortality in the event of a wildfire. **These are the only type 1 and**

Jenny Creek Late Successional Reserve Hazard Reduction High Priority Habitats to Protect or Treat



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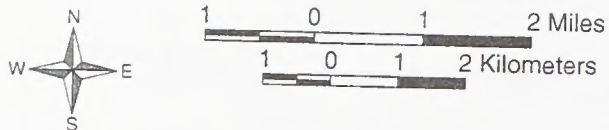
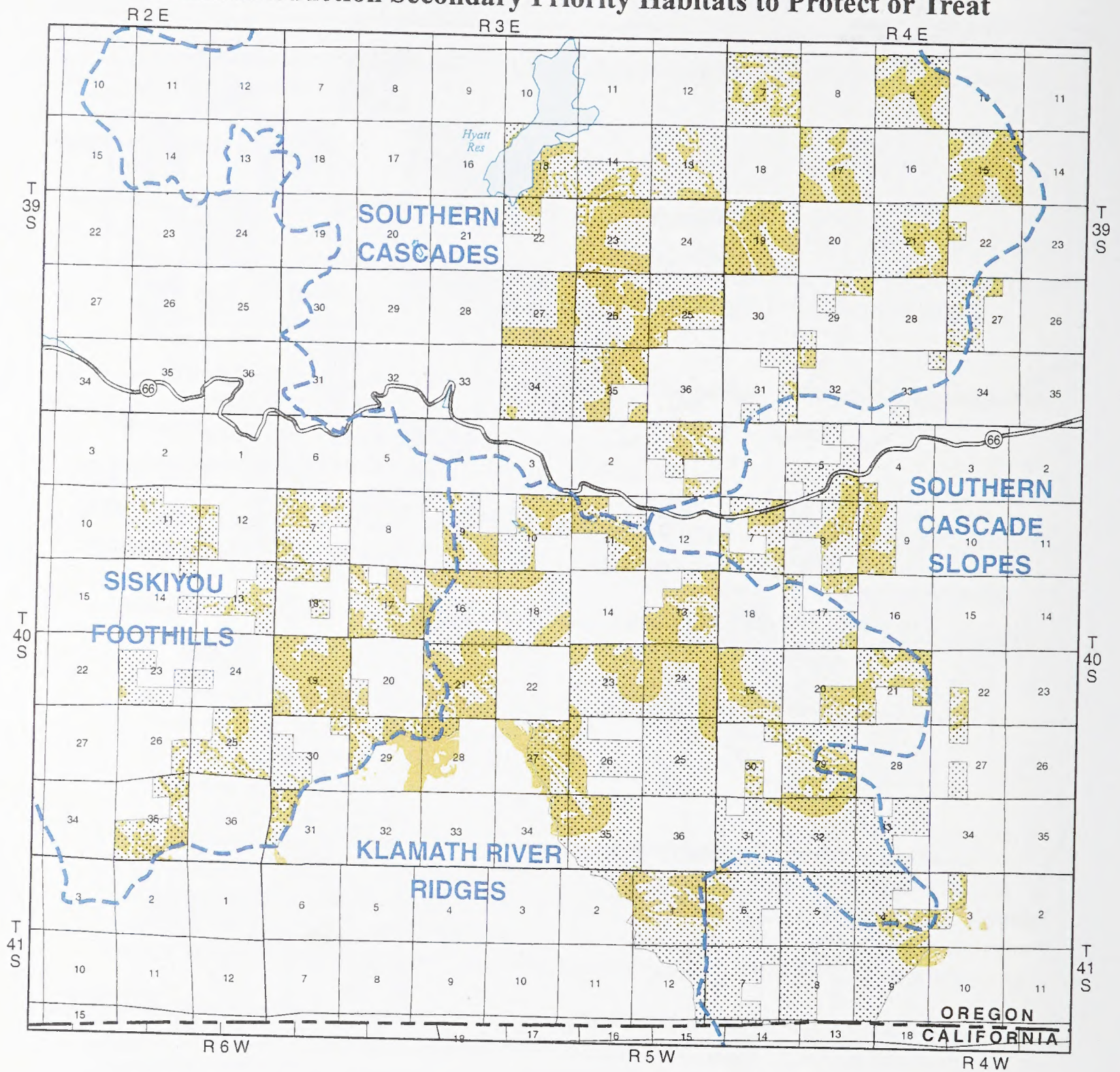
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MAP 4-3

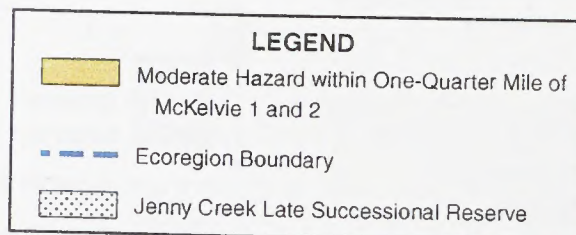
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Jenny Creek Late Successional Reserve Hazard Reduction Secondary Priority Habitats to Protect or Treat



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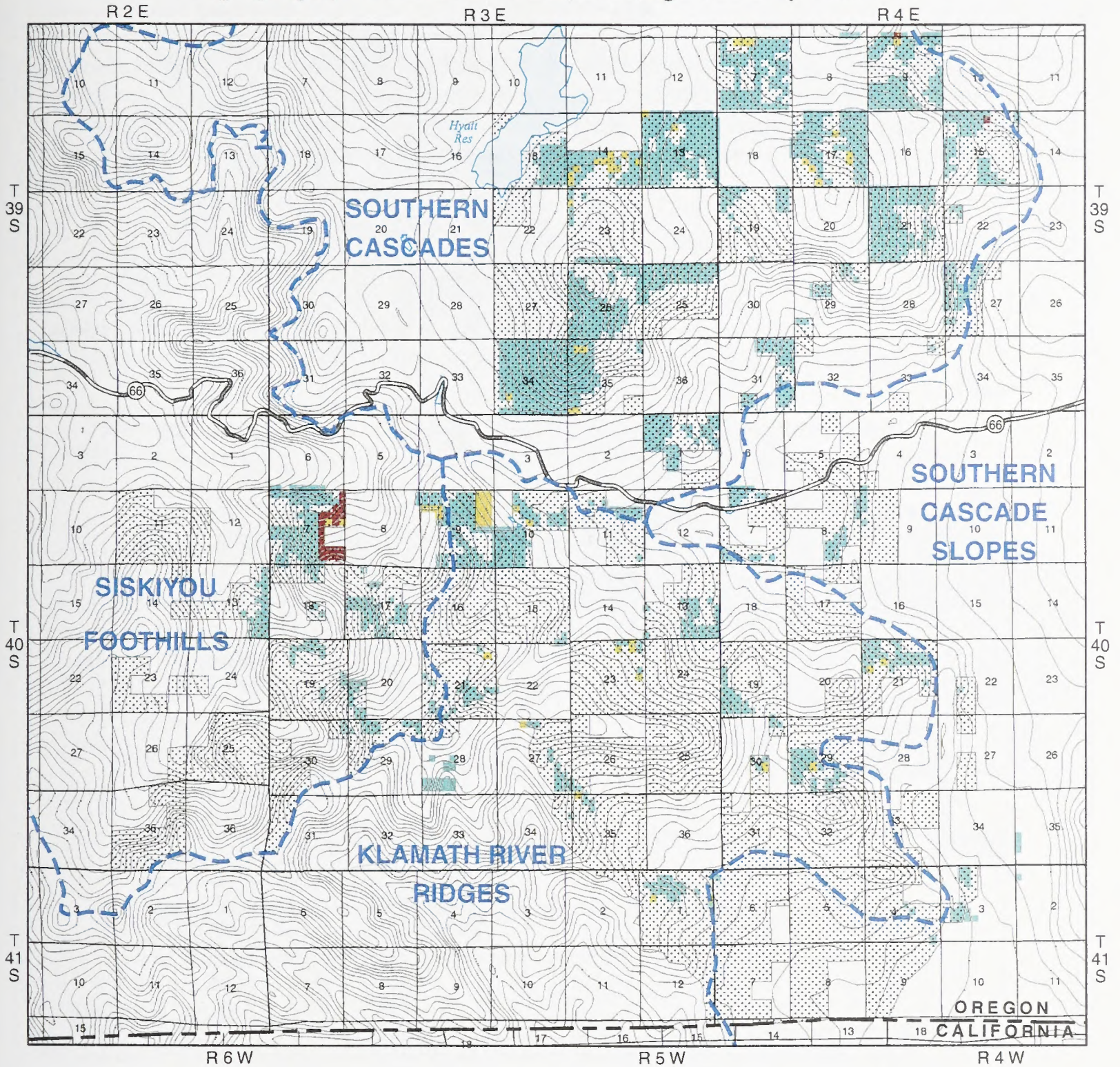
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MAP 4-4

D03-02-00:JR

Jenny Creek Late Successional Reserve Topography of Hazard Reduction High Priority Habitats



1 0 1 2 Miles
1 0 1 2 Kilometers

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LEGEND

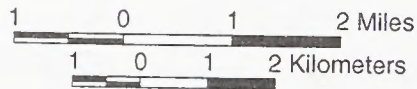
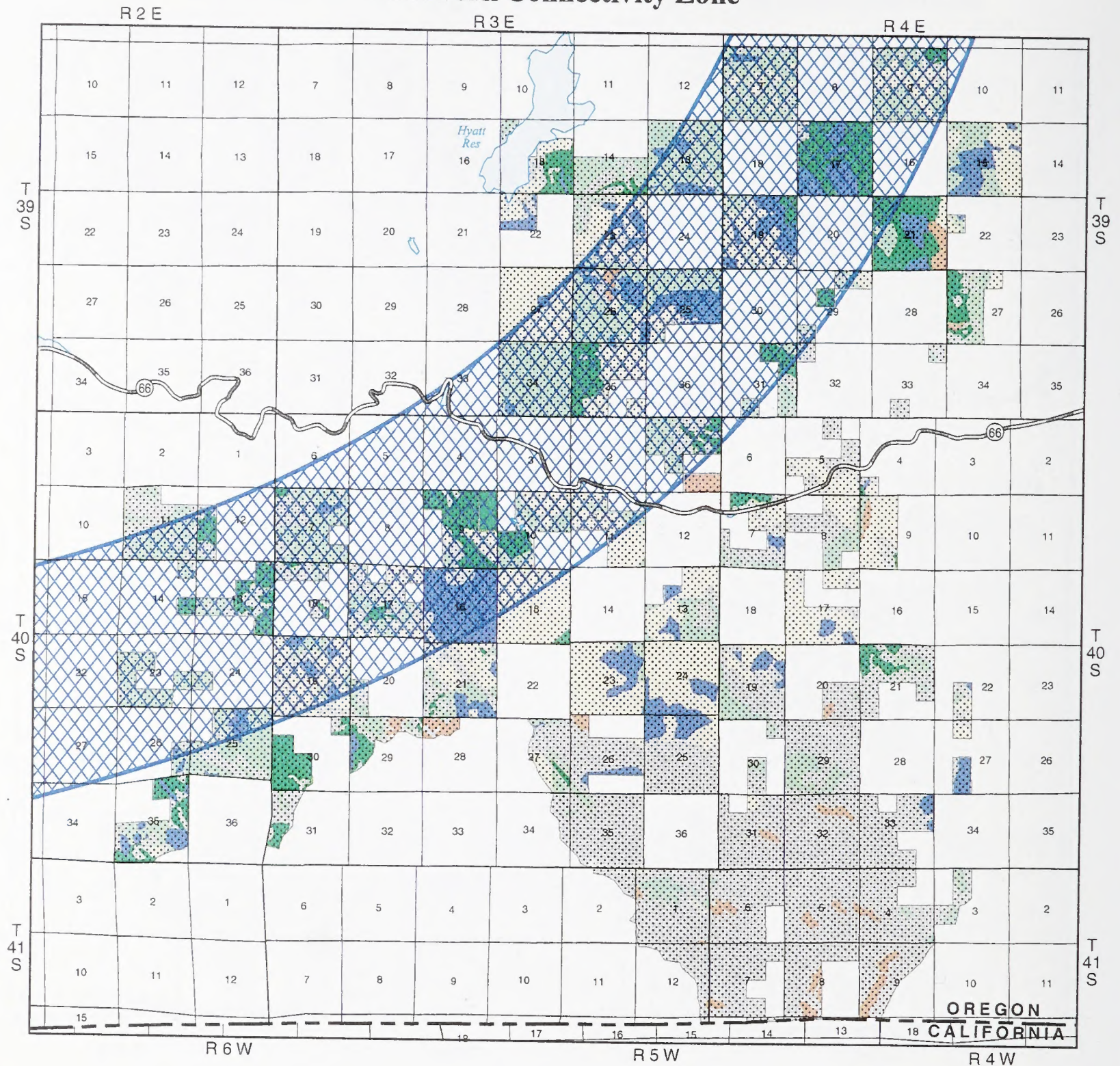
- McKelvie 1 and 2 Flames less than 4 feet
- McKelvie 1 and 2 Flames 4 to 8 Feet
- McKelvie 1 and 2 Greater than 8 Feet
- Ecoregion Boundary
- Elevation Contour -- Interval 100 Feet
- Jenny Creek Late Successional Reserve



MAP 4-5

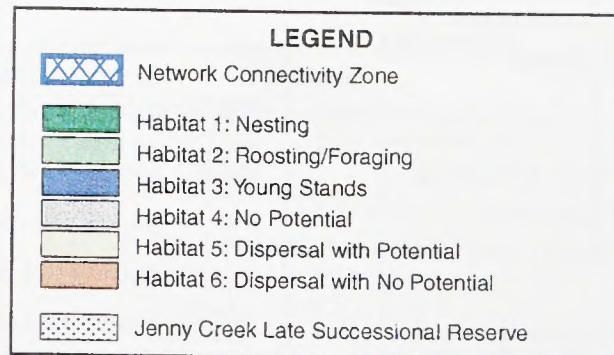
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Jenny Creek Late Successional Reserve Network Connectivity Zone



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MAP 4-6

D03-02-00:JR

2 stands identified for possible treatments of any kind in the LSR in the first decade.

Treatments in these stands would be designed to reduce fuel build up and ladder fuels while still maintaining stand function as either nesting habitat (type 1) or roosting/foraging habitat (type 2).

None of the type 1 or 2 habitat in the designated 100 acre owl cores would be treated in the first decade.

6. Reduce fine fuels in areas where fire suppression or land treatments have allowed fuels to accumulate to unacceptable levels (activity fuels reduction).

Implementation Area Control by Habitat Type and Ecoregion

Area control limits for respective habitat type in each ecoregion are given Table 4-21.

Table 4-21. Acres of Habitat Types 1 and 2 in the LSR where wildfire flame lengths are predicted to be 4 feet or greater, or have been identified as high fire hazard stands

Ecoregion	Predicted Flame Lengths Greater Than 8 Feet*	Predicted Flame Lengths 4 to 8 Feet*	High Fire Hazard	Total Acreage
South Cascades	29	194	110	333
Siskiyou Foothills	100	30	123	253
Klamath River Ridges	0	110	60	170
South Cascade Slopes	0	0	70	70
Total	129	334	363	826

* Corresponds to a predicted 89% stand mortality based on potential wildfire effects (see Tables 2-25 and 2-26).

** Corresponds to a predicted 53% stand mortality based on potential wildfire effects (see Tables 2-24 and 2-26)

E - Connectivity of LSOG Habitat Within and Adjacent to the LSR

Connectivity is defined by the Forest Ecosystem Management Assessment Team (FEMAT) as "A measure of the extent to which conditions among LSOG forest areas provide habitat for breeding, feeding, dispersal, and movement of LSOG associated wildlife and fish species." Since this LSR, and most importantly the western portion of the LSR, is considered a critical east-west connectivity area between the Cascades and Siskiyou Ranges, maintaining connectivity at both the stand and landscape levels. It is a priority to protect the LSOG habitat within a landscape band approximately 3 miles wide in this area (see map 4-6). The National Council for Air and Stream Improvement, a timber industry group, is currently conducting a five-year research study on the effects of silvicultural

prescriptions on NSO habitat use in the Emigrant drainage within this area. It is estimated it will take 20 to 30 years for young stand to develop into dispersal habitat. When considering areas for treatment, it is important to conduct a spacial analysis of patch size and juxtaposition.

Recommended Habitat Treatment

1. Protection and retention treatments around LSOG habitat, and around and within dispersal habitat that are important to dispersing animals between LSRs within the LSR network.
2. Protect and enhance areas of early and mid-seral vegetation that coincide with landscape features that are important to dispersing animals between LSRs within the LSR network. Emphasis for treatments will be on even-aged stands that have been regenerated following timber harvest. In young pole/sawtimber stands the canopy closure opening should be such that they will recover to a NSO dispersal level within 10 years while gaining treatment desired structural attributes.
3. Protect and enhance areas of early and mid-seral vegetation that coincide with landscape features that are important to dispersing animal within the Jenny Creek LSR such as within riparian areas.
4. Treat areas of early and mid-seral vegetation adjacent to "isolated" stands of LSOG habitat that respond to treatment in order to promote greater interior LSOG habitat refugia throughout the LSR.
5. Create additional large blocks of LSOG habitat where they are absent. Stands within blocks of federal ownership could be treated to enhance or restore LSOG habitat. Provide block of LSOG to decrease fragmentation and facilitate movement or nesting opportunities across the landscape.

Potential Land Acquisition and Land Interest Activities

The NFP/ROD (C-17) itemizes reasons for land exchanges. The intent of any acquisitions in the area of the LSR must be to benefit the LSOG species for which the LSR was established by either improving the quality, quantity, or connectivity of LSOG habitat.

Current Conditions

The Jenny Creek LSR covers a total area of 66,743 acres. The Bureau manages 34,007 acres or approximately 51 percent. Of the lands BLM administers, 29,150 acres are O&C lands and 4,857 acres are Public Domain. The remaining private lands, 32,736 acres, are owned by large timber companies, ranchers, and a number of small owners located along Highway 66 in the Lincoln and Pinehurst areas. The largest land private owners are timberland managers. The ownership pattern is essentially checkerboard but with many tracts made up of only partial sections.

Occasionally, members of the public or corporations propose land acquisitions, and it is necessary to determine what (if any) interest the government has in acquiring the proposed parcels. In order to assign priorities to proposed parcels in and adjacent to the LSR, a hierarchy was developed based on the over-all objectives of the LSR as stated in the NFP/ROD.

The basic criteria consist of a "high, medium, and low" ranking as described below:

- High: Lands currently occupied by Threatened or Endangered species and within connectivity corridor.
- Medium: Lands within LSR with high quality habitat for LSOG species and not occupied or occupancy is unknown, within corridor, or borders BLM LSR lands.
- Low: Lands not bordering BLM LSR lands.

Appendix M breaks criteria down further for a total of 22 ranked categories. The intent is for each proposed parcel to be assigned a rank and for the decision maker to consider this ranking when deciding whether or not to pursue the acquisition proposal.

Recommended Practices

Acquisition of private lands, or interests in private lands, adjacent to BLM LSR lands should be considered where acquisition would contribute to connectivity, protection and enhancement of late-successional and old-growth forest ecosystems. Interest in lands includes conservation easements, cooperative management agreements, and memoranda of understanding (MOU).

F - Aquatic Related Projects

Maintain, restore, and protect watershed functions and natural structures that result in high quality habitat for native fish and other aquatic organisms.

The primary concerns with aquatic resources in the Jenny Creek LSR are to improve water quality and water quantity, and restore functioning conditions within degraded stream channels and flood plains. Issues related to water quality include road maintenance, forest management, and livestock grazing. Water quantity can be influenced by land management activities that alter the natural processes of snow melt and runoff. All of these factors can influence the degree to which stream channels and flood plains can be restored to a desired natural condition.

Specific events should trigger treatment within the Riparian Reserve portions of the LSRs. Any treatments calling for the reduction of CWD shall not fall below the standards set in the desired condition section for the specific areas.

Hazard Reduction in Riparian Reserves

Fire is an important ecological process in the landscape, the riparian areas are not separate from the landscape and they have been influenced by fire. As long as prescribed fire meets the objectives for

soil protection, canopy closure, and retention of CWD in Riparian Reserves, there should be no long term negative effects to water quality or watershed processes. In all cases, treatments involving Riparian Reserves will be part of larger scale efforts. Efforts will be made to ensure fuels treatments do not further degrade Key Watershed areas.

Recommended Practices

1. Use of prescribed fire within Riparian Reserves is expected.
2. Protect stream shading, water quality, and other watershed values when burning.
3. Plan for times and conditions that ensure a cool burn in areas adjacent to stream corridors.

Riparian Reserves

Plan management activities that will meet Aquatic Conservation Strategy Objectives (ACSO). Where ACSO are not being met, change management directions that may be contributing to this situation, and plan projects that will improve watershed conditions.

Recommended Practices

1. Monitor conditions and update watershed analyses as information is developed.
2. Maintain well established riparian vegetation.
3. Manage stands along perennial streams so that adequate shading is restored and maintained. Maintain species and age diversity in riparian corridors that have potential for introduction of CWD into riparian and aquatic habitats.
4. Riparian Reserve Plantation Management. The amount of riparian areas currently in plantations is not precisely known at this time. While a more site specific plan would provide exact stand locations, it is important to note we expect thinning of plantations within the Riparian Reserves to occur. No heavy equipment is expected to be used in Riparian Reserves and their entries should be minimized.

Key Watersheds

Key watersheds are the highest priority for watershed restoration (NFP/ROD p. C-7). All management activities in the Jenny Creek LSR would be done in strict compliance with Aquatic Conservation Strategy Objectives and Best Management Practices.

Recommended Practices

1. Evaluate roads located in Riparian Reserves for relocation, decommissioning, or need to bring up to appropriate standards (USDI 1992, pp. 162-164).
2. Construct or improve all stream crossings to allow for adequate fish passage and to accommodate at least a 100-year flood event, including associated debris (USDI 1992, p. 87). Any human-made berms that restrict floodplains shall be removed.
3. Alterations in grazing prescriptions shall be made wherever livestock may be contributing to streambank instability or delay of riparian recovery (USDI 1992, p. 172).
4. Planting of riparian trees may be warranted if natural recruitment of vegetation is slow or lacks diversity. Riparian surveys should be completed throughout the LSR.

Stream Channels and Floodplains

Recommended Treatments

1. Monitor current management practices on BLM land to ensure consistency with standards derived from the NFP/ROD, RMP/ROD, and other policies and directives that ensure reasonable protection for stream channels and floodplains on Bureau lands.
2. Additional control of trespass and allotment cattle may be necessary to ensure adequate streambank and riparian recovery.
3. Survey stream reaches and increase CWD in streams and manage riparian areas to provide continued natural levels of CWD inputs.

Water Quantity

Recommended Treatments

1. Decrease unnatural winter runoff by reducing road densities and outsloping roads to prevent the concentration of runoff at cross drains and draws.
2. Work to restore stream channels to a naturally functioning condition, including the capacity for bank storage of water.
3. Reforest lands which have been harvested and restore to conditions that will retard accelerated runoff of snow melt and rain.
4. Work to re-allocate water rights for the Box O Ranch to instream use and encourage the Oregon Water Resources Department to adopt ODFW recommended minimum streamflows for Jenny Creek and TID to augment summer flows in Jenny Creek from stored water in Howard Prairie and Hyatt reservoirs.

Water Quality

Recommended Treatments

1. Following Best Management Practices (RMP/ROD pp. 149-178) when undertaking road maintenance, timber harvest, livestock grazing, and other management activities.
2. Evaluate riparian plant communities determine if planting or thinning might benefit stand conditions.
3. Manage habitat to improve water quality to levels that adequately support thriving populations of native fish and macroinvertebrates providing high quality water for downstream requirements.

Transportation System

Recommended Treatments

1. Reduce road density by decommissioning roads or restricting access in unstable areas, meadows, riparian areas, and other sensitive areas as needed.
2. Continue to improve stream crossings to 100-year flood intervals.
3. Provide adequate fish passage when upgrading fish-bearing stream crossings.

4. Improve drainage from roads by performing preventive road maintenance and constructing adequate numbers of drainage structures.
5. Reduce open road density by gating and barricading roads. This will reduce harassment to wildlife species.
6. Close unsurfaced roads during the wet season. Seasonally close or decommission unsurfaced roads. Most roads are natural surfaced spur roads and should be closed with gates, barricades or other semi-permanent barriers.
7. Repair/decommission all permanent roads near wet meadows to reduce damage to the surrounding area.
8. Reduce road densities or improve drainage in areas with unstable soils. Maintain adequate surface on roads used year-round, and schedule maintenance outside the wet season. Replace cross drains that discharge on steep, or unstable ground. Where possible, design roads to outslope with rolling dips, and eliminate roadside drainage ditches. Relocate roads that are in, or are restricting flood plains. Avoid constructing new roads that are full benched on steep slopes, or where water tables are near the surface of the ground. Ensure adequate fish passage at stream crossings. During road upgrades and maintenance, or stand thinning activities, stockpile down wood from removal sites to place in riparian areas where CWD is lacking. Through education or physical barriers, discourage off highway vehicle use of unsurfaced roads especially in the wet season. Enforce regulations regarding prohibition of off road activities.

Deferred Habitat Management Watersheds

A deferred watershed is an RMP administrative designation that defers an area from habitat management for a ten-year planning period. The only deferred land in the LSR is a small subcompartment of the Keene Creek subwatershed that drains into Parsnip Lakes toward springs that feed into Keene Creek (see Map 1-9). The area was heavily logged on public and private lands, creating large compacted areas and sediment in one of the lakes.

Recommended Treatments

1. Defer from forest habitat (timber harvest) management lands within subcompartment of the Keene Creek subwatershed that drains into Parsnip Lakes toward springs that feed into Keene Creek .
2. Allow for partial hydrologic recovery of the subcompartment in the next decade.
3. Protect and enhance conditions of LSOG forest related species (NFP/ROD, A-4). This includes the species and organisms of the soil.
 - Maintain existing protection status described in the NFP/ROD and Medford RMP/ROD.
 - Enhance recovery by coordinated efforts with private landowners for appropriate monitoring and restoration.

Livestock Grazing

Management actions should protect, maintain, or improve water quality, riparian-wetland areas and upland plant communities, and achieve properly functioning riparian ecosystems.

The Resource Management Plan for the Medford District lists the "Best Management Practices" designed to achieve Oregon water quality standards. These "Best Management Practices" are selected and implemented as necessary based on site-specific conditions to meet water quality, soil, and/or fisheries objectives for specified management actions.

Recommended Practices

1. Monitor, evaluate, and adjust livestock management practices where necessary to improve streambank and riparian habitats. Consider development of off-stream water sources where appropriate to assist improving water quality. Consider protecting cold water springs and seeps where necessary to protect populations of Survey & Manage mollusks.
2. Consider fencing springs, seeps, and water developments to protect water quality and riparian ecosystems.
3. Ensure rest for plant growth and vigor during the critical growing period.
4. Monitor, evaluate, and adjust livestock management practices to meet resource objectives.
5. Resolve management conflicts through the development of grazing management plans.
6. Promote ecological recovery through appropriate forage utilization levels.
7. Develop and implement recovery plans for riparian areas.

G - Potential Treatments in Non-Forest Plant Communities

The Klamath River Ridges Ecoregion has 3,878 acres (31 percent of ecoregion) identified as non-forest (non-LSOG) with high fire risk plant communities interspersed with the LSOG habitat. The South Cascade Slopes Ecoregion is a mosaic of non-forest communities interspersed with mixed conifer that have a dominant pine component. The Southern Cascades Ecoregion is predominantly mixed conifers and white fir plant communities and therefore, has the most LSOG habitat of the three areas. The Siskiyou Foothills Ecoregion has a mix of mainly conifer communities interspersed with some non-forest plant communities at lower elevations. See Table 4-22 for a breakdown of general plant communities by geographic areas.

Table 4-22. General plant communities by ecoregions

General Plant Community	Southern Cascade Slopes (9i)	Southern Cascades (4g)	Siskiyou Foothills (78b)	Klamath River Ridges (78g)	Total Area (acres)
Grass/shrub/woodland mosaic	3,081	141	1,354	3,740	8,316
Juniper domination	84	576	486	480	1,626
Pine domination	132	175	661	1,269	2,237
Mixed conifer	2,285	7,662	3,002	6,339	19,288
White fir	0	1,597	276	580	2,453
Semi-wet/wet meadow	9	69	0	9	87
Total (acres)	5,591	10,220	5,779	12,417	34,007

Concepts, Criteria and Treatment Standards for Grass/Shrub/Woodlands

1. Unique plant community compositions and structures form an important part of the landscape diversity. Every effort must be made to maintain these specialized/unique plant communities.
2. Patches of Oregon white oak and California black oak frequently identify corresponding patches of native plants. While the exact mechanism of this relationship is unknown (the mechanism may implicate mycorrhizae, shading, and hydraulic lift), preserving Oregon white oak will also serve to maintain patches of native plants.
3. Most hardwood species appear to suppress shrubs. Since hardwoods are generally less flammable than conifers and wedgeleaf ceanothus, maintaining hardwoods may decrease the cost of future vegetation manipulations.
4. There are many examples of individual plants, lichens, mosses, fungi, and wildlife species that are dependent on a very particular condition of a plant community. Maintaining a range of conditions within all vegetation classes will ensure the persistence of fauna and flora across the landscape.
5. Since dispersion, initial establishment, and growth until sexual maturity is critical to all organisms (plant and wildlife), maintaining an interspersed of all condition classes within plant communities is critical. Such interspersed would maintain proximal sources of propagules for plant and wildlife no matter what their preferred habitat(s).
6. Shrubs frequently eliminate herbaceous plants from a plant community through competition for resources (nutrients, water, sunlight). Since many herbaceous species are short-lived in

the seedbank, restorative measures may include seeding with native plants to reduce erosion and ensure the establishment of native plants following treatment.

7. The undesired characteristics of high shrub canopy require a maintenance schedule preventing long-term dominance by shrubs and prevention of fuels detrimental to the persistence of hardwoods.
8. Since little information exists on pre-historical conditions in shrublands and oak woodlands, inference from life-history characteristics should be used to validate management decisions.
9. Individual prescriptions cannot meet all management objectives. In management units with conflicting management objectives, compromise needs to be achieved by the spatial arrangement of the full range of prescriptions across the landscape.

Landscape-level Control Recommendations

1. Fifty percent of the total area should remain untreated for each plant community identified on the ground. This, together with the range of prescriptions applied, will ensure a range of conditions across the landscape.
2. Twenty-five percent of the treated plant community can be retreated within five years, unless undesirable circumstances arise (mass germination of shrub seedbank).
3. The initial untreated area defined as requiring treatment should remain untreated for ten years, following which fifty percent can be treated.

Grasslands and Shrublands Treatments

1. The three predominant ecological concerns regarding grass/shrublands are: (1) annual grass invasion, (2) starthistle invasion, and (3) increased shrub canopy due to fire suppression. Figure 4-1 identifies some of the treatments that will be applied to grass/shrublands within the constraints imposed by LSR management objectives.
2. Management within grasslands, shrublands, and woodlands should subscribe to meeting the LSR Objectives II, III, and IV. A generalized 'desired future condition' for grasslands, shrublands, and woodlands will incorporate a reduction of fuel-loading over the landscape, while also recreating a range of conditions (relating to plant life-form composition and fuels) across the landscape.

Woodlands Treatments

In many areas of the Jenny Creek LSR, grasslands and shrublands transition into woodlands. Figure 4-2 defines some of the most common woodland conditions found within the Jenny Creek LSR. With an exception of domination by exotic weeds, all states defined in Figure 4-2 are desired on the

landscape. However, fire suppression may have resulted in an unfavorable relative abundance of some of the states across the landscape.

Recommended Treatments

See Figure 4-2 and wildfire treatments below.

Wildfire Treatments within Grasslands and Woodlands

1. The Klamath River Ridges and the South Cascade Slopes Ecoregions have the highest priority for prescribed burning activities and density management. Annual fire starts are common in this area associated with lightning strikes during late summer. Prescribed burning activities will receive priority in non-forest communities dependent on their location in relationship to LSOG habitat.
2. The Southern Cascades Ecoregion has a low level of non-forest habitat, moderate topography and is at low risk of catastrophic fire and thus has a lower priority relative to Klamath River Ridges.
3. The Siskiyou Foothills Ecoregion has the lowest plant community prescribed burning priority. The National Council for Air and Stream Improvement, a timber industry group, is currently conducting a five-year research study on the effects of silvicultural prescriptions on NSO habitat use in this drainage. Generally, activities on BLM lands in Emigrant Creek will be minimal until after the research and harvest activity on private land is completed because of expected habitat impacts in the mixed ownership.

Semi-Wet Meadows

High elevation wet meadows have been subjected to disturbance from grazing, OHV incursion, road construction, timber harvest in adjacent white fir communities, and weed invasion. Hydrology plays an important role in the ecosystem function and maintenance of high elevation semi-wet meadows. These special communities are important water sources for downstream flows and their integrity should not be compromised if cool, clear water is expected. In addition, surrounding white fir plant communities also play an important role in high semi-wet meadow ecosystem function and the health of unusual wet meadow plant species. Trees may play a role in enhancing snow accumulation. Shade from trees bordering the edges of meadows prevent premature snow melt. Management of wet meadows should consider the following:

Figure 4-1. Plant Community Changes in Grassland and Shrubland Impacted Sites of the Jenny Creek LSR.

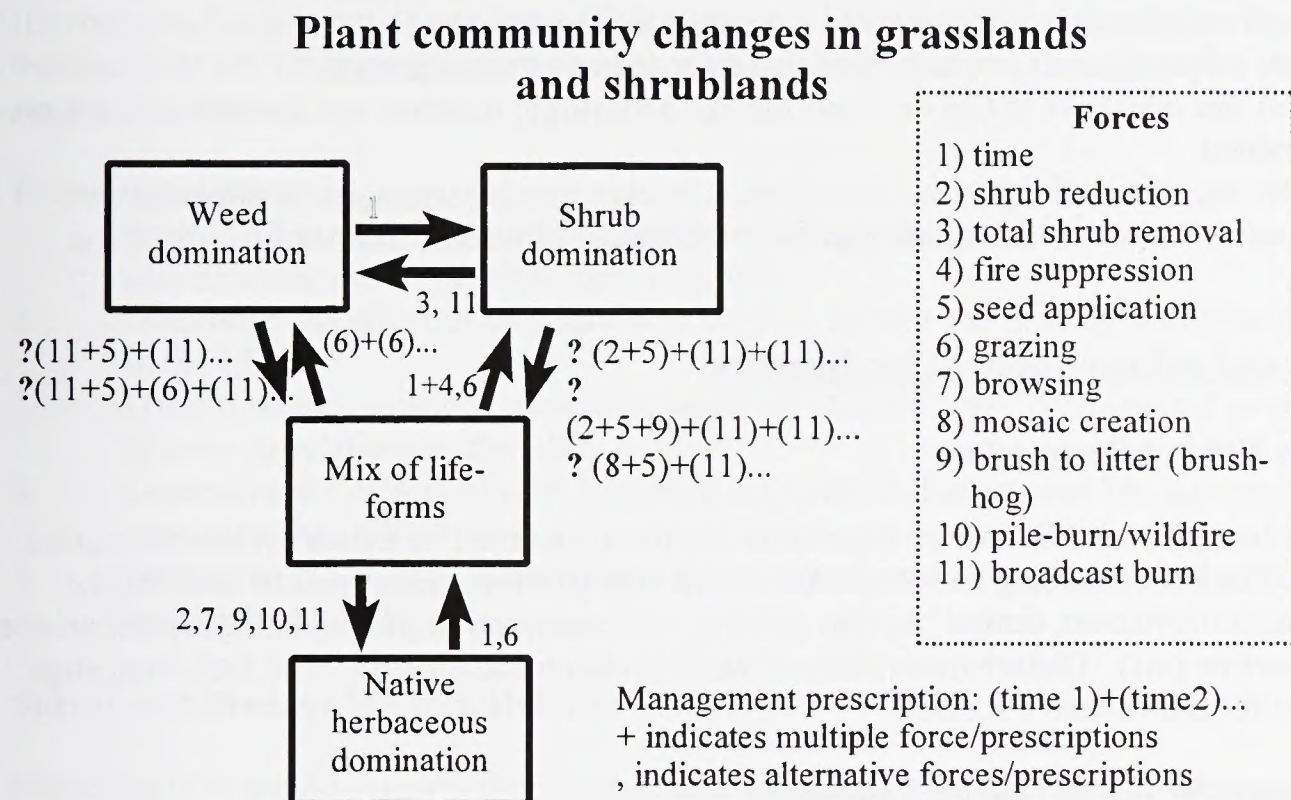
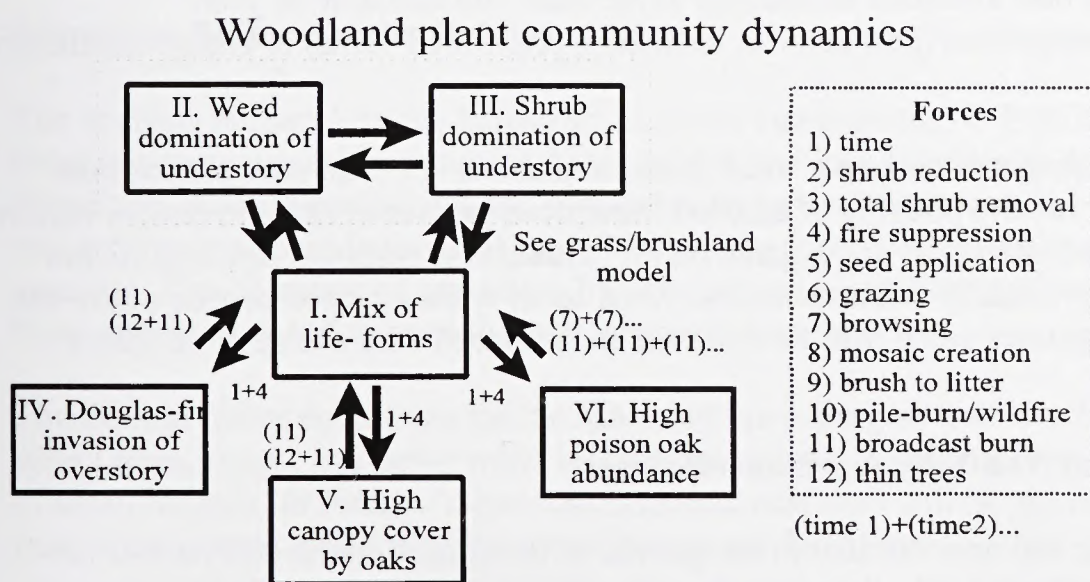


Figure 4-2. Plant Community Changes in Woodlands



Recommended Treatments for Semi-Wet Meadows

1. Limit the construction of new roads through wet meadows. Meadows should be crossed only as a last alternative with minimum damage to meadows and hydrology.
2. Repair all wet meadow roads to avoid compromising hydrology.
3. Close all informal roads or roads not needed for access or management.
4. Close all wet meadows to OHVs. Ruts disrupt hydrology, increase soil erosion, and improve weed habitat.
5. Carefully monitor grazing in wet meadows. Develop grazing strategies to minimize disturbance, improve water quality, prevent the spread of weeds, and degradation of the habitat.

H - Promote and enhance desired biodiversity**Native Species Habitat Restoration**

Portions of the Jenny Creek LSR where vegetation has been disturbed by natural or human-caused activities should be restored using native species where ever possible. Examples of disturbance include: fire, land movement, timber harvest, grazing, and construction (roads, trails, recreation sites, log landings, borrow pits). Disturbance results in weed invasion and erosion. The following steps should be taken to restore native species.

Recommendations for Native Species Restoration

1. Inventory the Jenny Creek LSR for sites that require restoration.
2. Begin an aggressive weed eradication program.
3. Select suitable native species that match the ecological parameters of the site.
4. Collect propagules (seeds, bulbs, cuttings) that are genetically suitable (from the general area) for the ecological conditions of the site.
5. Propagate planting stock at near by plant nurseries (genotype selection).
6. Plant stock using the best available technology at the most suitable time of year.
7. Engage in active management (pest control, fertilizers, prescribed burns) to ensure maximum success.

It should be noted that reseeding natives into a weed dominated site is never an easy proposition. Successful reclamation may require planting of adapted introduced grasses in order to restore nutrient cycling. Use of these adapted grasses as an "organic pump" should also compete and hold niches against weedy species and eventually exhaust noxious weed seeds within the soil profile of the site. If appropriate, the adapted grasses could then be removed and replaced with site specific native species.

Special Status Vascular and Non-Vascular Plants Habitat

Survey and Manage vascular and non-vascular plant species, as designated in the NFP, are or are suspected to be in the Jenny Creek LSR. Direction from the NFP/ROD and RMP/ROD address management of known sites and survey strategies. A list of Survey and Manage non-vascular plants

from Appendix J2 of the FSEIS for the Northwest Forest Plan can be found in Appendix B. Draft management recommendations for Survey and Manage vascular plants are in preparation and will be adopted when approved. Draft management recommendations are available for bryophytes (Bryophytes Installment 1) and fungi (Castellano and O'Dell 1997). The effects of proposed management activities on sensitive plant species will be considered during project level planning and implementation.

Recommendations

1. Establish baseline data on the Survey and Manage and sensitive plant species in the LSR (distribution, demographics, reproduction).
2. Determine the effect of ungulate herbivory on Survey and Manage and sensitive plant species in the LSR.
3. Determine the impact of recreation activities on Survey and Manage and sensitive plant species populations in the LSR.
4. Determine the effects of LSR treatment activities on Survey and Manage and sensitive plant species in the LSR.
5. Determine the effects of weed control activities Survey and Manage and sensitive plant species in the LSR.

Survey and Manage Mollusk Habitats

Objective is to provide suitable habitat for these species so they can carry on their essential life functions and functional ecosystem roles. The desired habitat conditions vary by species and are largely unknown.

Recommendations

Apply survey protocols and management recommendations as determined under NFP standards and guidelines.

Protection Buffer Species Habitat

The analysis prepared by the Scientific Analysis Team for the NFP/ROD indicated that additional measures were needed to ensure viability of rare and locally endemic species (see Chapter 2, NFP Protection Buffer Species) in areas outside of designated reserves. The assumption at the time was that any management in the LSR would have to be fully compatible with, if not beneficial to, these species. The objective of protection buffers and snag retention is to ensure the long-term viability of those species deemed to need these protection measures.

The desired future conditions for the habitat of the great gray owl is to have meadows with large defect trees, snags, and down wood around their edges. These meadows would have high populations of small rodents for forage. Also, stands around nest sites will be protected from impacts that would reduce the canopy closure or number of snags and defect trees.

For the woodpeckers, all stands with the potential to provide abundant snags of the appropriate species, size, and decay classes shall be managed to support 100 percent of the potential populations of these species. See tables 4-17 through 4-19 for recommended snag standards and guidelines.

Recommendations

1. Identify great gray owl nest sites and establish a 0.25 mile buffers from activities that could reduce or degrade habitat features essential to nesting and rearing.
2. The forest stands around meadows and other natural openings would be protected by 300-foot buffers. No activity would occur in these buffers that would degrade habitat features essential to great gray owl nesting, rearing, and foraging.
3. Prevent levels of grazing in meadows that would degrade the grass/forb layer to the point that small rodent populations are negatively effected. Monitor grazing utilization.
4. Implement inventory and monitoring protocols for the species discussed above so that the protection buffers can be applied where needed.

Noxious Weed Control

Federal land managers shall continue actively implementing management practices to reduce noxious weed infestations. There is strong cooperation with the Oregon Department of Agriculture's efforts to control and identify target species by tracking the distribution of target species on Federal lands. Noxious weed populations must be located to increase the effectiveness of control efforts.

Medford District BLM cooperates with Oregon Department of Agriculture, adjacent National Forests, and local counties to institute an integrated weed management program emphasizing a proactive ecosystem approach for noxious weed control and eradication on all public land. The Oregon Revised Statutes (ORS 570) make provisions for control of noxious weed pests on private land. The Rogue River and Klamath National Forests; Jackson, Klamath, and Siskiyou counties; and the BLM Lakeview and Redding districts, are important cooperators in weed control in the Jenny Creek LSR.

Control measures available to the BLM for noxious weeds are detailed in the Northwest Area Noxious Weed Control Program FEIS/ROD (December 1985) and Supplement (March 1987). Available controls include:

- biological agents (insects, competitive planting),
- mechanical control efforts (hand pulling, burning, mowing),
- cultural (seed testing, machine/vehicle washing), and
- chemical (herbicide control).

Any herbicide use will follow the procedures outlined in the FEIS/ROD (pp. 1-7) and those listed in the *Western Oregon Program-Management of Competing Vegetation, FEIS*.

Other controls that may be considered are:

- control of livestock/pack animals to prevent ground disturbance,
- control weed dissemination; and
- control road, track, and/or trail access.

Recommended Treatments

1. Apply all integrated weed management techniques to control seeds.
2. Monitor and protect undisturbed habitat.
3. Survey and identify infestations.
4. Minimize introduction of non-native species into the LSR.
5. Treat small isolated populations of noxious weeds.
6. Restore native species in areas where success is possible.
7. Treat large population areas where success is possible.
8. Restore large population areas where success is possible and funding is available.

Deer Winter Range

Objective is to provide high quality forage and thermal cover and to minimize vehicular disturbance during the winter months. This is particularly critical in the area south of State Highway 66.

The desired future condition is to have native grasses, forbs, and shrubs in good condition and available to deer. It is also desirable to have all timber stands that are capable of providing thermal cover function in that capacity. The open road density should be no greater than 1.5 linear miles per square mile.

Recommendations

1. Convert areas now dominated by exotic grasses and forbs to native species that would be endemic to the sites.
2. Prevent any management actions from spreading noxious weeds.
3. Regenerate decadent brushland.
4. Ensure overgrazing does not occur on the winter range.
5. Put forest stands with the potential to function as thermal cover on a silvicultural trajectory that will enable them to attain this function.
6. Keep open road densities at 1.5 linear miles per square mile or less.

Deer Summer Range

Objective is to provide forage for the deer herds that spend the summer in the higher elevations of the LSR. This will be increasingly difficult as stands develop LSOG habitat characteristics, particularly in closed canopy stands. Management activities designed to enhance forage on deer summer range would not occur in cases where it would prevent or retard development of LSOG habitat. Land with no LSOG habitat potential (Habitat Type 4) could be managed for forage production. Another

objective is to assist ODFW with correcting the buck/doe ratio problem that has developed in recent years.

There should be high quality forage conditions in natural meadows and brush fields (all areas not capable of growing LSOG habitat). There would be sufficient hiding cover and a sufficiently low open road density to allow a much higher buck survival rate through the general rifle deer season.

Recommendations

1. Improve forage habitat conditions in natural meadows and brush fields by combinations of management actions, such as burning, noxious weed removal, fertilization, regeneration by pruning, and copicing.
2. Identify roads that are no longer needed due to the LSR designation and close them long term or permanently.

Range/Livestock Management

Manage to provide healthy and productive riparian systems with diverse plant and wildlife species which purify water, and dissipate stream energy.

Provide suitable habitat conditions that ensure survival and perpetuation of special status species.

Manage for vigorous and healthy rangeland ecosystems that provide for watershed function and soil stability, and provide forage for existing livestock operations.

Since the completion of the *Medford District Rangeland Program Summary*, short-term monitoring data has been collected. The primary goal of this data was to ensure that livestock numbers are within the carrying capacity of the range. This action is the backbone of the rangeland management program and provides the first step to ensuring plant vigor, rangeland health, and watershed condition.

Currently, many of the stocking rates within the Jenny Creek LSR are believed to be within the grazing allotment carrying capacity. Further utilization studies are presently being completed on allotments with interim stocking rates to determine whether there are distribution or additional stocking rate problems.

If stocking rates within the Jenny Creek LSR are within the carrying capacity of the land, then animal husbandry practices must be considered as contributing to the remaining problems. These include conflicts within the rural interface, livestock distribution with localized excessive utilization, and loss of stream side vegetation within riparian zones. Rangeland management direction must be accompanied by good animal husbandry practices or these issues will not be resolved. Practices needed include: riding, animal placement, timely movement and removal of stock, salting, water development, and possibly fencing to enhance distribution. Livestock handling is seen as the weakest link in present management.

Recommendations

1. Update program map (Map 2-8) and document the encroachment of noxious weeds within the LSR. This program should discourage ground-disturbing activities and ensure that disturbed sites are seeded to prevent invasion. Work closely with Oregon Department of Agriculture to encourage continued development and release of biological control agents.
2. Develop a site-specific allotment management plan for those allotments within the LSR that require improved management to meet land use objectives. A thorough review of proposed improvements to resolve distribution and management problems should be completed.
3. Continue to work with rural interface homeowners to resolve conflicts. Current regulation and State Law do not favor private homeowners within open range areas. The Bureau should continue to look into these cases.

Areas of Fragile Soil

Fragile (Sensitive) Soil, is an RMP administrative designation. Fragile Soils are designated in the BLM Medford District's Timber Production Capability Classification (TPCC). The Resource Management Plan (RMP) refers to Fragile Soils under Appendix 2-WA-1, Best Management Practices (BMPs). For the Jenny Creek LSR, this category refers only to Fragile Mass Movement (FP: Fragile Pyrochlastic) TPCC category. BMPs for fragile soils were designed for timber harvest and related habitat manipulation activities, and wildfire scenarios.

Within the RMP, Fragile (Sensitive) Soils were delineated based on TPCC designations. Soil Conservation Service (SCS) soil maps are designed to delineate soil types, while TPCC delineations are designed to address timber productivity. These high clay fragile soils are susceptible to mass movement, such as rotational slumps and cutbank failures. They also are susceptible to mud flows, dry ravel on cutbanks, and are the source of turbid runoff water. Infiltration/permeability is relatively low. These soils, when disturbed, are a main source of fine sediment and turbidity for fish-bearing streams.

For the purposes of this document and future plans, use of the SCS Soil Survey is preferred over the TPCC for designating fragile soils. Fragile SCS soil series in the LSR include: Bybee, Tatouche, Medco, Carney, Skookum, and McNull.

Recommendations

1. For future restoration project priorities, these fragile soils shall be considered as very high priority where surface disturbance, concentrated runoff flow, and/or bare soil conditions are evident. Protective measures, such as seeding, straw mulching, planting, water bars, sediment traps, and road improvements/ decommissioning, would be appropriate for all fragile soils.
2. In compartments where fragile soils are dominant and road density is greater than four miles per square mile, road density should be reduced to less than four miles per square mile, if practical, through decommissioning and/or natural contouring.
3. There should be no new road construction on fragile soils.
4. Minimize surface disturbance on fragile soils (USDI 1992, App. 2-WA-1).

5. The erosion rate and soil loss should be equivalent to similar soils in an undisturbed condition.

Soil Productivity

Nutrient cycling is essential to maintain and enhance LSOG forest ecosystems. Soil organisms play a key role in forest ecosystem nutrient cycling. Soil organisms include: vertebrates and invertebrates (worms; arthropods, including insects; slugs and snails) plants, fungi, and bacteria. The persistence of desired soil organisms is essential for the breakdown of organic matter into materials available to plants.

Natural nutrient recycling is essential in order to sustain long-term soil productivity in a LSOG ecosystem. Factors limiting soil micro-organism population types and numbers need to be closely evaluated before management actions occur. Also important to nutrient recycling are the numbers and types of arthropods and other organisms that initially break down the organic material for decomposition by soil micro-organisms.

Recommendations

1. Apply Best Management Practices during all ground and vegetation disturbing activities.
2. Utilize silvicultural systems that are capable of maintaining or improving long-term soil productivity.
3. Provide a renewable supply of large down logs well distributed across the landscape in a manner that meets the needs of soil organisms and provides for ecological functions.
4. Manage vegetative fuel loading in a manner that prevents wildfire behavior with high temperature intensities and long duration.
5. Sample and monitor soil micro-organism populations to establish baseline data and evaluate effects of management activities.

Special Management Areas

The continuing significance of the special management areas in the LSR depends on the maintenance of conditions that originally led to their establishment. This might include the exclusion of devastating wildfire (but not the exclusion of fire); stopping or reversing, if possible, the invasion of alien weeds; and natural ecosystems restoration whenever possible. These designated areas have restrictions that will limit management options.

Soda Mountain Wilderness Study Area

Section 603 of FLPMA requires BLM to manage lands under wilderness review in these words:

During the period of review of such areas and until Congress has determined otherwise, the Secretary shall continue to manage such lands ---- so as not to impair the suitability of such areas for preservation as wilderness.

Recommendations

1. Increase education and information efforts to help alleviate the OHV problems.
2. Vehicle restrictions or OHV closures on surrounding lands.
3. Employ the latest techniques for managing OHVs within wilderness.

Hyatt-Howard Special Recreation Management Area

The Hyatt-Howard Special Resource Management Area (SRMA) is an area around Hyatt Lake and Howard Prairie Reservoir (approximately 42,000 acres) where a commitment has been made to provide specific recreation activities and experiences on a sustained yield basis.

The management objective for the SRMA is to provide recreation opportunities ranging from semi-primitive to roaded in a natural manner that will:

- Promote public use and enjoyment of the public lands;
- Protect natural resource values on the public lands;
- Minimize conflicts among users; and
- Protect the health and safety of recreationists who use the public lands.

The desired future condition for the SRMA will be achieved when the actions in the Recreation Area Management Plan (RAMP) have been implemented. The existing developed facilities and opportunities do not adequately serve the existing and projected needs of the recreating public. Additional camping opportunities within the existing developed sites should be provided, play areas constructed, facilities improved, and maintenance and use supervision increased. Dispersed use will continue as long as it is consistent with the goals of the LSR.

Recommendations

1. Remove sections 15 and 22 of T39S, R3E from the LSR, see LSR Boundary Adjustment section below and Map 4-8.
2. Develop no new recreation facilities within the LSR that are outside of sections 15 and 22.

Applegate Trail

Activities within the general area of the trail route would require archaeological surveys, and if sites were discovered, appropriate measures should be taken. BLM's objectives are to do nothing that would negatively impact sites associated with the Applegate Trail, unless approved by the State Historic Preservation Officer or managing agency.

Recommendations

1. Provide interpretive information about the Applegate Trail in brochures or displays at BLM kiosks or campgrounds.
2. Ensure that BLM personnel are aware of the trail route so it will be considered in all planning actions.

Pacific Crest National Scenic Trail (PCNST)

The Pacific Crest National Scenic Trail, as managed, meets the objectives as stated in the Comprehensive Plan, so the desired future condition is already being achieved and will be maintained by the management objectives.

Recommendations

Place informational and interpretive materials along the trail to place positive explanation of activities occurring along this portion of the trail.

Elk Management Area

The elk management area in the Jenny Creek watershed was established to emphasize elk management and falls mainly in the Klamath River Ridges and South Cascade Slopes Ecoregions. The elk management area encompasses 15,300 acres of the Jenny Creek watershed and overlays deer winter range. Part of the LSR overlays the elk management area.

When consistent with other higher priority LSR objectives, improve elk habitat conditions. Keep the elk population in balance with deer use on the winter range.

The desired future condition is to have elk numbers in balance with deer numbers and available forage so that deer are not displaced from the winter range and habitat conditions are not degraded.

Recommendations

1. Follow recommendations for deer winter range.
2. Monitor the elk population.
3. Keep elk populations in balance with deer populations and deer forage needs

I - Other Land Management Activity Guidelines/Recommendations**Fuelwood Gathering**

Fuel wood gathering will be permitted only in existing cull decks, where green trees are marked by silviculturists to thin (consistent with this LSRA), and to remove blowdown blocking roads within the road prism.

Developments

Development of new facilities that adversely affect the LSR will not be permitted.

Routine maintenance of existing facilities will continue. Such developments include campgrounds, recreational residences, cross-country ski areas, utility corridors and electronic sites.

Habitat Improvement Projects

Projects designed to improve conditions for fish, wildlife or watersheds continue where their effects are considered to have negligible effects on LSOG habitat.

Special Forest Products

Monitor program and update management plan. Recently the demand for the harvest of special forest products (mushroom collection, Christmas trees, mistletoe collection, etc) has been increasing. This has led to a concern for the sustainable harvest levels of these products along with the protection of the resource within the LSR. There is relatively little information regarding the amount of harvest of some of these species which is occurring with the LSR.

Dispersed Recreation

Monitor program and update management plan. Dispersed recreation uses, including hunting, fishing, and hiking, are a normal use of the Jenny Creek LSR. All Terrain Vehicles have regularly used most of the roads and trails within the LSR. Education, use limitations, traffic control devices are being evaluated to determine whether these practices retard or prevent attainment of LSR objectives.

Research

A variety of wildlife and other research is proposed within the LSR. Most of the research is proposed outside the current or potential LSOG habitat. Activities within current or potential LSOG forest habitat will only be considered if there are no equivalent opportunities outside the LSR.

J - LSR Boundary Adjustments

Based on an examination of existing use, operational logistics, and habitat quality of lands within and immediately adjacent to the LSR, it is recommended that the LSR boundary be adjusted in 3 areas (Map 4-7). These proposed adjustment areas have been given the following names: (1) Southern Slivers, and (2) Hyatt Lake Section 15/22 and Jenny Creek Section 23. The following is a discussion of each the areas proposed for adjustment.

Southern Slivers

The Southern Slivers area includes land in three ecoregions as displayed in table 39 below which also displays the acreage and distribution of the six habitat types present in the Southern Slivers area. See chapter one for description of the Southern Slivers. The LSRA team recommends the RMP/ROD be amended to add the Southern Slivers to the LSR (see Table 4-23).

Table 4-23. Acres of habitat types in Southern Slivers area proposed to be added to LSR (see Table 2-4 for habitat type descriptions; this area also includes one NSO site)

Boundary Adjustment Area	Habitat Type 1	Habitat Type 2	Habitat Type 3	Habitat Type 4	Habitat Type 5	Habitat Type 6	Total Acres
Siskiyou Foothills	7	3	0	8	3	1	22
South Cascade Slopes	0	19	0	167	89	68	343
Klamath River Ridges	55	136	13	517	352	50	1,123
South Cascades	0	0	0	0	0	0	0
Total Acres	62	158	13	692	444	119	1,488

Hyatt Lake Sections 15 and 22

It is the recommendation of the LSRA team that all land in sections 22 and 15 of Township 39 south, Range 3 east of the Willamette Meridian be removed from the LSR. The land in these sections include, or are adjacent to, established recreational developments that receive a lot of use. This use is unlikely to be fully compatible with LSR objectives.

Specific disturbances include noise generated by campers and boaters, fuelwood gathering within and adjacent to the designated recreation area, and heavy snowmobile use in and around the designated recreation area. If the area stays in the LSR, any future development of the recreation facilities should be analyzed for conflicts with the LSR objectives. Conflicting problems include proposed projects such as ball field expansion, sewage lagoon expansion, day use areas, parking areas, and campground expansion. Recreation demands continue to increase and projects are likely to be proposed. Removing the area potentially impacted by these projects from the LSR would greatly simplify the planning process for such projects. Additionally, hazard tree removal is necessary in developed recreation sites and along the associated high use roads. Current use and planned developments are not likely to provide LSOG at least in the immediate recreational areas adjacent to the reservoir. This activity is counterproductive to achieving LSR objectives. Removing the designated recreation area and a buffer area from the LSR and replacing it with functional habitat the LSRA teams' recommendation. Habitat types in the Hyatt Lake Recreational Area are given in Table 4-24.

Table 4-24. Acres of habitat types in Hyatt Lake area proposed for removal from LSR (See Table 2-4 for habitat type descriptions)

Boundary Adjustment Area	Habitat Type 1	Habitat Type 2	Habitat Type 3	Habitat Type 4	Habitat Type 5	Habitat Type 6	Total Acres
Hyatt Lake Recreation Area (South Cascades Ecoregion)	137	26	80	182	137	0	562
Total Acres	137	26	80	182	137	0	562

Jenny Creek Section 23

The LSRA team recommends the Jenny Creek section 23 in T.39S., R.4E. be added to the LSR. This section includes slightly more suitable habitat with a designated 100 acre activity center. This site is part of a cluster of 3 NSO sites in close proximity that are somewhat isolated from other NSO sites in the area. This section also contains the confluence of Jenny Creek and Johnson Creek. Both of these creeks are fish bearing streams and have riparian reserves approaching 400 feet in width on each side of the stream. Part of the Jenny Creek ACEC falls within this section as well. Most of the section is in either Habitat Type 1 or 2. The adjacent private lands have been heavily harvested and Section 23 probably serves as a refugia for LSOG species in an area with very little LSOG habitat. The inclusion of this section to the LSR would add an important, relatively contiguous, block of LSOG habitat to an LSR that is deficient in those habitat types.

Table 4-25. Acres of habitat types in Section 23, T.39S., R.4E., proposed for addition to LSR (see Table 2-4 habitat type descriptions)

Ecoregion	Habitat Type 1	Habitat Type 2	Habitat Type 3	Habitat Type 4	Habitat Type 5	Habitat Type 6	Total Acres
South Cascades Slopes	50	361	102	38	34	0	585
South Cascades	0	47	15	2	0	0	64
Total Acres	50	408	117	40	34	0	649

Net change of acreage in boundary adjustment 2 is found in Table 4-26 below.

Table 4-26. Acres of habitat types in Section 23, T.39S., R.4E., proposed for addition to LSR (see Table 2-4 habitat type descriptions)

Ecoregion	Habitat Type 1	Habitat Type 2	Habitat Type 3	Habitat Type 4	Habitat Type 5	Habitat Type 6	Total Acres
Hyatt Lake Sections 15/22	137	26	80	182	137	0	562
Jenny Creek Section 23	50	408	117	40	34	0	649
Total Acres	-87	382	37	-142	-103	0	87
Habitat Types 1 and 2 (suitable)	-87	382					295
Habitat Types 3 and 5 (potential)			37		-103		-66

Summaries of LSR Acreage With and Without Boundary Adjustments

The following table reflects the area and acres that were used to perform the analysis and mapping of the LSR acreage. See Table 4-27 for the distribution of these acres across the six habitat types.

Table 4-27 (LSR assessment acres). Acres of habitat types by ecoregion based on original RMP map of LSR (Southern Slivers in, Hyatt Lake in, Section 23 out)

Ecoregion	Habitat Type 1	Habitat Type 2	Habitat Type 3	Habitat Type 4	Habitat Type 5	Habitat Type 6	Total Acres
Siskiyou Foothills	949	2,115	416	1,530	711	58	5,779
South Cascades Slopes	95	462	148	3,737	821	328	5,591
Klamath River Ridges	508	1,257	1,222	5,975	3,237	219	12,418
South Cascades	1,580	3,559	1,413	932	2,544	191	10,219
Total	3,132	7,393	3,199	12,174	7,313	796	34,007

Table 4-28 displays the distribution and amounts of the six habitat types within the LSR in the event that the three recommended boundary adjustments are made.

Table 4-28. Acres of habitat types by ecoregion based on 3 recommended proposed boundary adjustments (Hyatt Lake out, Section 23 in, Southern Slivers in)

Ecoregion	Habitat Type 1	Habitat Type 2	Habitat Type 3	Habitat Type 4	Habitat Type 5	Habitat Type 6	Total Acres
Siskiyou Foothills	949	2,115	416	1,530	711	58	5,779
South Cascade Slopes	145	823	250	3,775	855	328	6,176
Klamath River Ridges	508	1,257	1,222	5,975	3,237	219	12,418
South Cascades	1,443	3,580	1,348	752	2,407	191	9,721
Total Acres	3,045	7,775	3,236	12,032	7,210	796	34,094

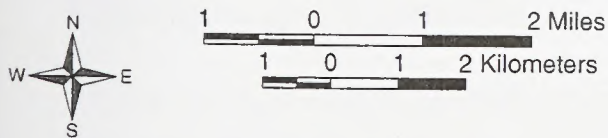
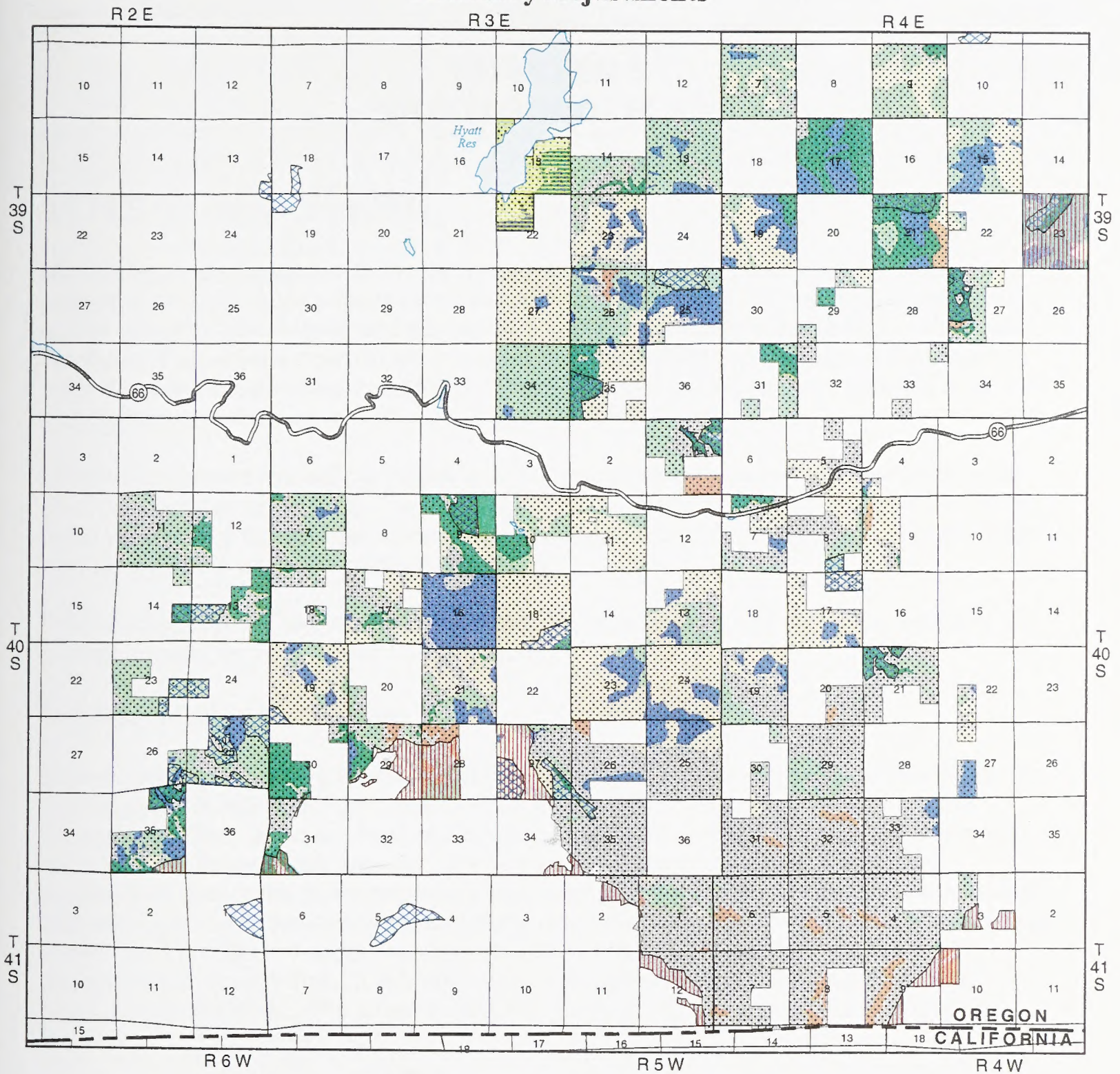
Table 4-29 displays the distribution and amounts of the six habitat types within the LSR in the event that the recommended boundary adjustments are not made. This is based on the current, official, corrected southern boundary.

Table 4-29 (current boundary). Acres of habitat types by ecoregions based on corrected southern LSR boundary map (Southern Slivers out, Hyatt Lake in, Section 23 out)

Ecoregion	Habitat Type 1	Habitat Type 2	Habitat Type 3	Habitat Type 4	Habitat Type 5	Habitat Type 6	Total Acres
Siskiyou Foothills	942	2,112	416	1,522	708	57	5,757
South Cascade Slopes	95	443	148	3,570	732	260	5,248
Klamath River Ridges	453	1,121	1,209	5,458	2,885	169	11,295
South Cascades	1,580	3,559	1,413	932	2,544	191	10,219
Total Acres	3,070	7,235	3,186	11,482	6,869	677	32,519

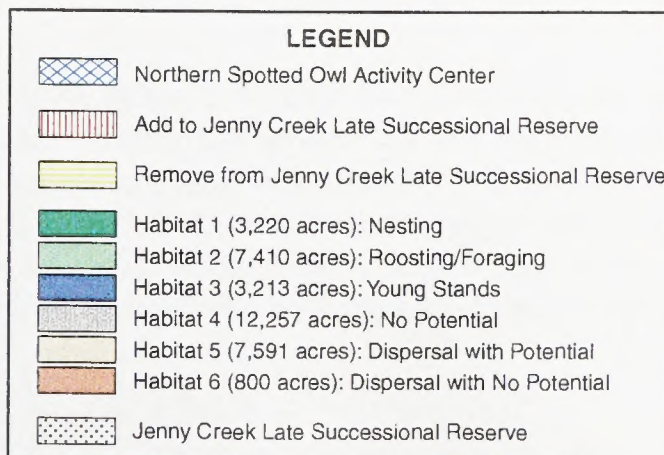
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Jenny Creek Late Successional Reserve Boundary Adjustments



U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Medford District
2000

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MAP 4-7

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CHAPTER 5 MONITORING PLAN

TYPES OF MONITORING

Monitoring strategies are tied to the stand and landscape scale description and application of existing conditions, desired future conditions, treatment needs, and criteria. LSR assessments should generally include proposed monitoring and evaluation components to help evaluate and determine if activities are carried out as intended (implementation monitoring) and achieve desired results (effectiveness monitoring). This monitoring discussion is not intended to be comprehensive or exhaustive.

LSRs require restoration and maintenance of late-successional character and habitat within the plant communities represented. The trends that occur on the landscape can only be measured by initiating effective and in-depth monitoring and research activities that track changes that occur over time whether natural or management related.

Three distinct types of monitoring, implementation, effectiveness, and validation, will be or are in place to meet the Jenny Creek LSR objectives.

Implementation Monitoring

Implementation monitoring reviews whether the standards and guidelines of a project or activity were applied. It asks: Does the project and/or activity follow the direction in its Resource Management Plan. An example of implementation monitoring would be the examination of a stand marking to ensure the prescription was properly interpreted and to evaluate if the assumptions used in the development of a harvesting plan are correct, and that the residual stand will be in good condition following harvesting. Implementation monitoring is important because it provides a process and opportunity to revise the operational assumptions and make improvements through time. It will also improve the probability of attaining the resource management objectives. The objective here is to examine monitoring social and biophysical issues relative to forest health.

Effectiveness Monitoring

Effectiveness monitoring evaluates projects and/or activities ability to meet the intended purpose and need and desired results. It evaluates whether the application of a management plan achieves the desired goals. The success of a management plan is measured by the standards set for desired future conditions. For example, spatial distribution, species composition, and development of LSOG forests are extremely important in LSRs. Effectiveness monitoring should look at conditions of habitat whether riparian or terrestrial and how they relate across the landscape.

Validation Monitoring

Validation monitoring is the process that determines to what degree the ecological and perhaps the social objectives have been achieved. It is a formal scientific process to investigate biological or social processes. Validation monitoring should facilitate measurable improvements relative to the attainment of goals and objectives when used as a feedback to management practices on the landscape. It determines if a cause and effect relationship exists between management activities and the managed resource. Validation asks if the underlying management assumptions are correct and if the protection, maintenance and restoration of habitat conditions are supporting stable and well-distributed populations of late-successional species. It should also foster an increased understanding of both ecological functions and processes over time.

Monitoring Scale

Monitoring needs to be accomplished at a variety of scales. The scale of the monitoring is largely defined by the scope of the organism or process being monitored. For example, monitoring habitat effectiveness for large animals that range across broad landscapes should occur at a scale that encompasses the range of habitats that are involved or utilized. In addition, there are habitats that may have particularly important constraints and/or needs at more than one scale. For example, a management plan developed for a watershed that is targeted as a high priority for density reduction might reflect the necessity for a higher level of canopy retention and stand structure in order to provide for needs such as plant migration, dispersion, connectivity or special species, at the province landscape scale. Consequently, monitoring relative to the attainment of objectives would occur at several scales. Monitoring at all scales should be designed such that the information is useful at the next highest scale and can be aggregated upward. For example, information and data gathered at the stand level, when aggregated with like stands, might possibly provide information as to the rate of development and ecological potential necessary to understand the development rate of habitat types at the landscape level.

Tracking plant community changes over time within individual stands and across the landscape are necessary for LSR management and feedback as treatments and projects occur. Stand level changes provide insight on how plant communities might react to management and ecosystem processes such as wildfire. Developing this information across the landscape helps land managers gain an understanding of dispersion of plant communities and the range of conditions within these communities. With this understanding managers can facilitate land attribute changes such as connectivity, balance of conditions and reduced landscape fire hazard to protect, enhance or rehabilitate late-successional habitat. While several sources of plant community data exist for the Jenny Creek LSR, few so far are capable of depicting stand and landscape-level plant community attributes at the desired data resolution to adapt and perform the necessary treatments needed across LSRs.

Baseline Information

Successful monitoring will require the establishment of baseline information at many scales. The degree of resolution and the usefulness of post treatment data depend heavily on the extent it relates to the pretreatment baseline information. For instance, it generally is not possible to determine the effects of density management on forest structure and growth without knowing these trends prior to treatment. Little baseline information presently exists for either the social or biophysical elements of the Jenny Creek LSR. Initiatives to determine what baseline information is needed as well as processes on how to collect, display, store, and use this data will continue to be developed. At the same time, several monitoring systems are currently in place.

MONITORING PROJECTS – LATE-SUCCESSIONAL HABITAT

Monitoring forest stands or other plant associations will be approached at a plant community level. As landscape planning evolves within the LSR, an inventory representative of associations within conifer plant communities will be monitored over time for stand structural changes, CWD, and snags. Associations will be determined following Atzet et. al (1996). SVIM data should serve as baseline data during this process. Adjacent non-forest community baseline data, which relies heavily on SVIM, will be assessed. The non-forest (late-successional) plant community assessments/monitoring is needed to manage at a landscape level in this LSR that provides protection for late-successional habitat in the dry Klamath province where patch size of late- successional forest stands are interspersed with or surrounded by fire prone woodlands, meadows, and chaparral.

Wildlife

Silvicultural baseline data in all Jenny Creek spotted owl cores has been collected as a measure of the best current habitat available. The information will be compiled and used to characterize desired habitat within and adjacent to the LSR. The 100-acre owl cores will be tracked over time for community and structural changes.

NSO monitoring of known and new sites will continue inside the LSR and within 2 miles of LSR boundaries. Monitoring should be done to interagency protocol standards and would include attempting to band all owls. Wildlife specialists propose to continue regularly capturing and banding of NSOs on sites in the Ashland Resource Area to note bird movement.

Goshawk monitoring should be increased in the LSR. The goal will be to determine reproductive success at sites annually. More data is needed to assess goshawk population health in the LSR.

Silviculture

At a stand by stand level, individual large tree vigor and growth should be tracked. Sugar pine is a representative and the priority species on most sites; although over the LSR as a whole, most species are being monitored.

Young stands (plantations and/or early seral) will be examined for stocking controls, species composition, canopy, snags, and CWD over time.

- Did thinning activities provide for species diversity?
- Were desired conditions achieved for fuel levels following the thinning operations?
- Are spacing requirements adequate and variable with the intent of achieving desired stand structure?
- Long term monitoring should include evaluating growth patterns, stand crown closure, and species diversity every 5-10 years to see if desired stand structure patterns are or will eventually be achieved.

Every ten years, monitoring and assessment of functioning can:

- Determine the percent of capable ground currently in LSOG habitat characteristics.
- Assess the risk to the LSR from large scale disturbance.
- Assess connectivity between LSOG stands within the LSR.
- Assess habitat characteristics and associated acreages within home range of known activity centers.
- Assess the effectiveness of the fuel management efforts and adjust priorities of these efforts based on this and future assessments.
- Assess the actual number of acres treated in the LSR as compared to those identified in the implementation plan.
- Complete an analysis of existing forest vegetation with the LSR.

LSR MONITORING – NOT SPECIFIC TO LATE-SUCCESSIONAL HABITAT

Fuels

Complete post burn evaluations to determine effectiveness of prescribed burns.

Determine if mortality to residual stands was within the acceptable range set in the burn plan.

Monitor flame lengths during underburns to insure mortality to desired species or protection of other species.

Determine if snag and CWD requirements were met.

Determine if prescribed fire objectives were met as described in Burn Plans:

- reduction of fuels by diameter size,
- reduction of live vegetation, and
- retention of duff layer.

Hydrology, Riparian, and Fisheries

The following will be done to monitor our success in maintenance, restoration, and protection of watershed function and structure as it relates to fisheries and aquatic habitat and the Aquatic Conservation Strategy Objectives. This will include monitoring of water quality and quantity, channel morphology, and aquatic organism populations.

1. Stream Flows - Fifteen-minute data at the Jenny Creek Gaging Station. Bi-monthly flow measurements at 12 sites in the Jenny Creek Watershed. Establish baseline data for the Emigrant Creek drainage and establish staff gages.
2. Air Temperature - Fifteen-minute data at the Jenny Creek Gaging Station. Daily Maximum/Minimum at Howard Prairie Dam (NOAA). Hourly data from Parker Mountain RAWS.
3. Stream Temperature - At sites throughout the LSR. Thirty-minute interval temperature data will continue to be collected during the summer by BLM and other cooperators in the area. This data will be collected year-round at the Jenny Creek Gaging Station. Grab sample temperatures will also be gathered with flows.
4. Turbidity, Conductivity, pH - Grab samples of this data will be gathered with flows and during visits to temperature monitoring sites.
5. Precipitation - Continuous measurement at the Jenny Creek Gaging Station and Dutch Oven Creek, and Parker Mountain RAWS. Daily precipitation totals, as well as snowfall and snow-on-the-ground, by NOAA cooperators at Howard Prairie Dam and Green Springs Power Plant.
6. Fish population - Jenny Creek - Sample at two-year intervals at key locations.
7. Macroinvertebrates - Continue sampling at four- to six-year intervals at twelve locations in or adjacent to the LSR, as indicators of water quality.
8. Stream Channel Condition - Physical stream surveys at ten-year intervals in the LSR. Resurvey of established channel cross-sections at 11 locations in the Jenny Creek Watershed at 5-year intervals. Annual resurvey of nine established channel cross-sections on or near the Box O Ranch.

9. Instream Large Woody Debris - This information will be tallied for all reaches requiring Riparian Reserves, as part of the LSR physical stream surveys done at ten-year intervals.
10. Riparian Condition - Establish photo points at key locations and photos taken at five-year intervals. Use standard five-year interval aerial photography to document change in the extent and character of riparian vegetation along major low-gradient streams.

Protection Buffer Vascular and Non-Vascular Plant Species, Survey & Manage Strategies 1 & 2

All sites of Survey and Manage strategy 1 and 2 and protection buffer species within the LSR will undergo ecological status monitoring as required by the NFP and approved protocols. This monitoring will examine species ecological amplitude, suitable microsite conditions, biological requirements, and characteristics.

Monitoring will include establishing areas where management will provide reserve areas for species population protection. This monitoring will examine the adequacy of the reserve area in protecting the population.

Implementation, effectiveness, and validation monitoring will be established in areas where management actions are expected to impact a population. This monitoring will examine the accuracy of the treatment, variances from the expected results, and the precision of the initial assumptions.

PLANT COMMUNITY INVENTORY AND MONITORING

Inventory and monitoring need to incorporate economic, management, ecological, and social goals. Within an adaptive management framework, correctly planned and implemented inventory and monitoring can contribute to our knowledge of the ecosystem at the population, community, and landscape level (Allan and Hoekstra 1991). The following recommendations for inventory and monitoring are designed to test current models of plant community dynamics and landscape ecology summarized by the diagrams presented in Chapter 4, Non-forest Plant Communities.

Tracking plant community changes over time within individual stands and across the landscape are necessary for creating an ecosystem management plan. Stand-level changes provide insight on how plant communities might react to management and ecosystem processes, such as wildfire. The same information depicted across the landscape creates a backdrop and landscape constraint for management. Only by understanding the dispersion of plant communities and their range of conditions across the landscape, can managers facilitate landscape attributes, such as connectivity, balance of conditions, and reduced landscape fire-hazard. While several sources of plant community data exist for the Jenny Creek LSR, few data-sets are capable of depicting stand

and landscape-level plant community attributes at a desired data resolution (species or life/growth form data resolution).

Satellite data generally have not yielded sufficient information for assessing management and ecological goals. Most other forms of inventory and monitoring are usually limited in scope. The data collected using the Soil and Vegetation Inventory Method (SVIM) (Thompson and Drewin 1983) from 1978 to 1981 are an exception. The SVIM data includes detailed information on plant community (on a species basis) and soils. An ability to derive general relationships between soils and plant communities allows managers to map plant communities the across the landscape, a prerequisite for understanding ecosystem processes.

The SVIM data provide an excellent baseline inventory across all plant communities of the Jenny Creek LSR. The SVIM data also provide information on the extent of the different conditions within grasslands, shrublands, and woodlands on public land. Within these drier plant communities, repeat collections of the SVIM data could satisfy the needs of implementation and effectiveness monitoring. Since plant community dynamics within shrublands and woodlands reflect differences in plant life/growth forms (grass, forbs, shrubs, and trees), transects along which foliar and canopy cover data (by species) are collected is optimal for validation monitoring.

Summary of Inventory/Monitoring and Analysis Needs

1. Create landscape plant community/association maps using SVIM data (to serve as a basis for ecosystem management).
2. Inventory associations within conifer plant communities (Atzet et al. 1996).
3. Create landscape-wide plant community condition maps derived using SVIM data (grasslands, shrublands, and woodlands) and Forest Operational Inventory data (conifer communities).
4. Inventory Survey and Manage species according to NFP survey protocols.
5. Create noxious weed control plan based on current weed inventory and SVIM data.
6. Examine small-scale spatial patterning of various plant communities across the landscape (mosaic-patterning of rosaceous shrub communities; mosaic-patterning of canopy cover openings within white fir communities).
7. Derive relations between plant communities, soils, listed wildlife and plants as an aide to understanding the ecosystem.

8. Inventory and map past timber harvest, livestock grazing, and fire events in lieu of understanding important ecosystem processes within the landscape.
9. Analyze landscape ecological attributes (connectivity within low frequency disturbance plant communities, balance of conditions within high frequency disturbance plant communities, etc.).
10. Identify available existing sources of data which could serve longer-term monitoring needs.
11. Update current state and transition models integrating plant community change, restoration, and landscape area-based summaries (see Chapter 4).

Alien Plants And Noxious Weeds

Containment and/or reduction of noxious weed infestations on BLM-administered land using an integrated pest management approach is a high priority issue and infestations are inventoried annually by the BLM or its county cooperators. Noxious weeds are not compatible with meeting the aquatic conservation strategy.

Alien plant species will continue to be monitored on rangeland as part of ongoing Nested Frequency PNC/PFC upland condition studies. On other sites, alien species monitoring should be carried out by appropriate department vegetation monitors and/or become a part of each staff member's field survey duties.

Noxious weed monitoring and control fall under the auspices of existing BLM-ODA-USFS-Jackson, Josephine, Douglas, Klamath, and Siskiyou counties cooperative integrated weed management programs. These programs provide identification through the designated weed surveys of the Butte Falls Resource Area weed survey crews, control as a cooperative between BLM and State/County Agriculture weed control personnel, and tracking by all public staff as well as dedicated weed survey crews. The opportunity for public and private weed management cooperation exists within the Jenny Creek LSR and efforts should be increased.

Range

The primary purpose of rangeland monitoring is to evaluate the effects of livestock grazing on vegetation communities. Forested sites that have been disturbed by past logging practices are referred to as transitional areas. Trend studies to monitor these disturbed forested areas for livestock effects is not practical from a rangeland monitoring standpoint. Grasslands, shrublands, meadows, and oak woodlands are more appropriate for rangeland monitoring.

One of the primary long-term rangeland studies is trend. Trend describes the direction of change in range condition based upon plant frequency. Frequency describes the abundance and

distribution of species and is useful to detect changes in plant communities over time. Other current studies include forage utilization, riparian and upland photo points, and precipitation data.

In August of 1997, the Bureau adopted new rules for rangeland health. Rangeland health can be defined as the degree to which the integrity of the soil and ecological processes of rangeland ecosystems are sustained. Additional studies and indicators for each standard of rangeland health will be developed in the future. These studies will relate to the functioning of both uplands and riparian systems.

Grazing is a controversial issue to many members of the public within the LSR. The CSEEA NEPA process should further identify specific needs and monitoring protocols for this area.

1. Monitor grazing allotments using standard monitoring procedures.
2. Evaluate effects of grazing to restore or enhance vegetation habitats.
3. Develop research or monitoring plots in cooperation with various groups to study ecology of the area.

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APPENDICES

Appendix A

Vegetation Classification and Plant Communities

Vegetation Classification and Condition

Franklin and Dryness (1973) and its supplement (Franklin and Blinn 1988) have been the standard reference for the vegetation of Oregon and Washington. Their discussion is organized by geographically-distinguished forest zones and geographic provinces. Discussion of the Rogue and Umpqua valleys' vegetation is presented in a major section, referred to as the Interior Valleys of western Oregon that also includes the Willamette Valley. In the Forest Zones of southwest Oregon section, they recognize the Mixed Evergreen (*Pseudotsuga*-*Sclerophyll*) Zone, the Mixed Conifer (*Pinus*-*Pseudotsuga*-*Libocedrus* [*Calocedrus*]-*Abies*) Zone, the *Abies concolor* Zone, and the *Abies magnifica shastensis* Zone. Each zone is further subdivided into plant communities or associations.

Three of the Franklin and Dryness zones are located in the Jenny Creek LSR, the Interior Valley, the Mixed Conifer, and the *Abies concolor* zones. The LSR is too far to the east for the Mixed Evergreen Zone. Although elevations reach 6,000 feet (6,134 feet Chinquapin Mountain and 6,089 feet at Soda Mountain), climate and topography precludes stands of *Abies magnifica* var *shastensis*. White fir (*Abies concolor*) is found at all but the lowest elevations.

Atzet et al. (1996) produced a field guide to forested plant association of the Rogue, Siskiyou, and Umpqua National Forests in southwestern Oregon. Their two-level classification replaces the zones of Franklin and Dryness (1973) with vegetation series based on the dominant, most shade tolerant, regenerating species on the site. Each series is further subdivided into plant associations. Their plant association key can be used to identify potential vegetation on undisturbed or minimally disturbed sites.

However, there are some problems with this scheme as applied to the Jenny Creek LSR (Atzet et al. 1996). It does not cover series that are nonforested, such as grasslands, brush fields, or series like western juniper that are on the eastern margin of the LSR. Of the 15 forested series, 4 are found in the LSR: Oregon white oak (*Quercus garryana*), ponderosa pine (*Pinus ponderosa*), Douglas-fir (*Pseudotsuga menziesii*), and white fir (*Abies concolor*). None of their sample sites were located in the LSR.

Based on the vegetation of California, Sawyer and Keeler-Wolf (1995) offer a further refinement in classification by covering a number of non-forested vegetation series. There is a serious philosophical feature that distinguishes Sawyer and Keeler-Wolf's work from that of Atzet et al. (1996). Atzet et al. classification is based on the concept of potential vegetation, while Sawyer and Keeler-Wolf describe what is growing on the site at the time of data collection. The potential

vegetation concept of Atzet et al. attempts to estimate the climax vegetation of a site after 500 years without disturbance (fire, disease, floods, wind, human intervention) by taking into account ecological succession. Sawyer and Keeler-Wolf and many vegetation mapping schemes "describe what you see" (Zedler 1997).

Kagan and Caicco (1996) developed the Manual of Oregon Actual Vegetation as part of the Oregon Gap Analysis Program to determine the biodiversity in nature reserves and in areas managed for their natural values. They developed their map from 1988 LANDSAT imagery and reflects the actual vegetation of the time rather than potential vegetation. The manual groups 133 primary vegetation types into 5 cultural land cover types, 7 natural land cover types, and 54 vegetation complexes. The manual describes each vegetation type by providing detailed floristic lists of the species that characterize the type arranged by diagnostic importance as trees, shrubs, forbs, grasses, and ferns and allies. A description of the vegetation, statement of distribution, elevational range, and map names are also provided. The GAP analysis map for Oregon is being updated and is currently unavailable.

The work of Fox et al. (1997) is another potential source of information. They have developed a database and map of existing vegetation in the Klamath Bioregion in northern California and southern Oregon based on LANDSAT imagery. The structural vegetation patterns and land conditions were classified in a modified California Wildlife Habitat Relationships (WHR) Systems that indicates habitat type (based on vegetation) by size class and crown closure for both public and private land. The classification based on LANDSAT imagery broadly distinguishes types at the level of Mixed Conifer (Fir or Pine), Mixed Conifer-Hardwood, Hardwood-Mixed Conifer, Mixed Hardwood, Greenleaf Shrub, Deadstick Shrub, Dead Grass/Forb, for example.

Thompson and Drewin (1983) reported the results of a soil/vegetation inventory to use as a tool in implementing rangeland resources in the southwest Cascades in the Ashland Resource Area. They sampled rangeland and forested sites for rangeland condition, suitability, soil correlation and productivity. For each site write-up area (SWA) the following observations were recorded at each site: soil unit identification, range site identification, vegetation strata identification, production capability, aspect and slope, suitability for grazing, acreage of the unit, and apparent trend [in range condition]. Approximately 7,000 SWAs were described to serve as the basis for a vegetation map of the area. The map covers about two-thirds of the Jenny Creek LSR. They recognized the following vegetative zones within the LSR: Klamath Dry Upland, Rogue Dry Upland, Soda Mountain/Table Mountain High Country, Parker Mountain Sugar Pine, and some elements of the Klamath County Vegetation Zone near Jenny Creek.

Thompson and Drewin were further able to distinguish a series of Range Sites within the LSR that include: Steep Foothill Grasslands, Steep Mountain Grassland, High Mountain Grassland, Dry Meadow, Semi-wet Meadow, Shrubby Scabland, Mahogany-Oak-Fescue, Oak-Pine-Fescue, Oak-Pine Oatgrass, Pine-Oak-Fescue, Douglas-fir Forest, Douglas-fir-Mixed Pine, Mixed Fir-

Mixed Pine, Mixed Fir-Oceanspray, and White Fir Forest. These plant communities are described below.

Plant Communities Description

Plant communities descriptions are presented below and associated plant communities dynamics are given below. General plant community acreage found within the Jenny Creek LSR is summarized by ecoregion in Table 2-2. Distribution of plant communities within Jenny Creek LSR and surrounding area is displayed in Map 2-3

Oak Woodlands

The trees are predominantly Oregon white oak (*Quercus garryana*) with some California black oak (*Q. kelloggii*), Pacific madrone (*Arbutus menziesii*), and large scattered ponderosa pines (*Pinus ponderosa*), both living and dead snags, that tower above the surrounding vegetation. The understory shrubs include: deerbrush (*Ceanothus intergerrimus*), poison oak (*Rhus diversiloba*), Oregon grape (*Berberis aquifolium*), whiteleaf manzanita (*Arctostaphylos viscida*), and some bitterbrush (*Purshia tridentata*). The ground layer consists of various forbs and grasses that include: spreading dogbane (*Apocynum androsaemifolium*), hairy honeysuckle (*Lonicera hispidula*), Puget balsamroot (*Balsamorhiza deltoidea*), California fescue (*Festuca californica*), whiteleaf lupine (*Lupinus albifrons*), and several paintbrushes (*Castilleja* sp.). Yellow starthistle (*Centaurea solstitialis*) and various annual grasses, Medusa-head rye (*Taeniatherum [Elymus] caput-medusae*), and bulbous bluegrass (*Poa bulbosa*) are well established naturalized weeds.

Oak woodlands vary from open savannas with a grass dominated understory to forest stands with intermingled Douglas-fir (*Pseudotsuga menziesii*) and ponderosa pine (*Pinus ponderosa*). On higher slopes, Oregon white oak may form solid stands of short (<6 m) trees with closed canopies intermixed with native plums and mountain mahogany. Oregon white oaks at higher elevations approach the diminished size and stature of Brewer oak (*Quercus garryana* var. *breweri*). On the flats, oak forest structure may consist of widely separated, large, old savanna-form oaks (>250 yr) surrounded by numerous younger (<125) crowded, forest-form oaks. Savanna-form oaks are recognized by their stout trunks, broad, spreading branches, and rounded crowns. Forest-form oaks have slender trunks, ascending branches and are much closer together. Presumably, the savanna-form oaks formed under a regime of frequent light fires. The crowded forest-form oaks developed with the cessation of fire in the last 100 years that allowed seedlings to grow to maturity.

Brush fields are occasionally interspersed in the oak woodlands. At lower elevations, patches dominated by whiteleaf manzanita (*Arctostaphylos viscida*), wedgeleaf ceanothus (*Ceanothus cuneatus*), and poison oak (*Rhus diversiloba*) are common. At higher elevations, deerbrush (*C. intergerrimus*), mountain whitethorn ceanothus (*C. cordulatus*), sunkbrush sumac (*Rhus trilobata*), and brown dogwood dominate the brush fields. Chokecherry (*Prunus virginiana*),

bittercherry (*P. emarginata*), Klamath plum (*P. subcordata*), birchleaf mountain mahogany (*Cercocarpus montanus*), pale serviceberry (*Amelanchier pallida*), and yellow rabbitbrush (*Chrysothamnus viscidiflorus*) also make up a significant portion of the brushfield flora. This complex collection of shrubs is commonly known as Southern Oregon Chaparral. Communities dominated by members of the rose family (plums and chokecherry (*Prunus* spp.), birchleaf mountain mahogany (*Cercocarpus montanus*), and serviceberry (*Amelanchier alnifolia*) are commonly referred to as rosaceous chaparral.

Mahogany-Oak-Fescue

A typically dry site with high densities of Oregon white oak and Birchleaf mountain-mahogany. Understory predominately consists of Idaho fescue (*Festuca idahoense*) and a variety of forbs. Soils are moderately deep with clayey subsurface horizons. Most sites occur on moderately steep to steep slopes.

Oak-Pine-Fescue

This site type occurs most typically on gently rolling hills at low elevations and on steep south-facing slopes at the higher elevations. Overstory is dominated by Oregon white oak and secondary amounts of ponderosa pine. Understory is mainly Idaho fescue (*Festuca idahoense*) with minor densities of bluebunch wheatgrass (*Agropyron* [*Pseudorogneria*] *spicata*). Forbs are variable. Soils are well-drained, shallow, and rocky.

Oak-Pine-Oatgrass

Canopy cover of Oregon white oak, usually at high densities, with minor amounts of ponderosa pine. Dominant grass is California oatgrass. Soils are clayey at subsurface horizons. These sites are typically found on gentle slopes or flats at both north and south aspects.

Oak woodlands in the LSR are predominately at lower elevations and on south- and west-facing slopes. Oak woodlands frequently represent the major tree dominated associations of the Agate Flat portion of the LSR (in the Lower Jenny Creek subwatershed) and on south-facing slopes of Keene Creek Ridge and Rosebud Mountain. Soils and fire have been the most frequently coarse influence. The result is a mosaic of brush fields, scattered trees, grasslands, and pockets of conifers.

The trees are predominantly Oregon white oak (*Quercus garryana*) with some California black oak (*Q. kelloggii*), Pacific madrone (*Arbutus menziesii*), and large scattered ponderosa pines (*Pinus ponderosa*), both living and dead snags, that tower above the surrounding vegetation. The understory shrubs include: deerbrush (*Ceanothus intergerrimus*), poison oak (*Rhus diversiloba*), Oregon grape (*Berberis aquifolium*), whiteleaf manzanita (*Arctostaphylos viscida*), and some bitterbrush (*Purshia tridentata*). The ground layer consists of various forbs and grasses that

include: spreading dogbane (*Apocynum androsaemifolium*), hairy honeysuckle (*Lonicera hispidula*), Puget balsamroot (*Balsamorhiza deltoidea*), California fescue (*Festuca californica*), whiteleaf lupine (*Lupinus albifrons*), and several paintbrushes (*Castilleja* sp.). Yellow starthistle (*Centaurea solstitialis*) and various annual grasses, Medusa-head rye (*Taeniatherum [Elymus] caput-medusae*), and bulbous bluegrass (*Poa bulbosa*) are well established naturalized weeds.

Oak woodlands vary from open savannas with a grass dominated understory to forest stands with intermingled Douglas-fir (*Pseudotsuga menziesii*) and ponderosa pine (*Pinus ponderosa*). On higher slopes, Oregon white oak may form solid stands of short (<6 m) trees with closed canopies intermixed with native plums and mountain mahogany. Oregon white oaks at higher elevations approach the diminished size and stature of Brewer oak (*Quercus garryana* var. *breweri*). On the flats, oak forest structure may consist of widely separated, large, old savanna-form oaks (>250 yr) surrounded by numerous younger (<125) crowded, forest-form oaks. Savanna-form oaks are recognized by their stout trunks, broad, spreading branches, and rounded crowns. Forest-form oaks have slender trunks, ascending branches and are much closer together. Presumably, the savanna-form oaks formed under a regime of frequent light fires. The crowded forest-form oaks developed with the cessation of fire in the last 100 years that allowed seedlings to grow to maturity.

Brush fields are occasionally interspersed in the oak woodlands. At lower elevations, patches dominated by whiteleaf manzanita (*Arctostaphylos viscida*), wedgeleaf ceanothus (*Ceanothus cuneatus*), and poison oak (*Rhus diversiloba*) are common. At higher elevations, deerbrush (*C. intergerrimus*), mountain whitethorn ceanothus (*C. cordulatus*), sunkbrush sumac (*Rhus trilobata*), and brown dogwood dominate the brush fields. Chokecherry (*Prunus virginiana*), bittercherry (*P. emarginata*), Klamath plum (*P. subcordata*), birchleaf mountain mahogany (*Cercocarpus montanus*), pale serviceberry (*Amelanchier pallida*), and yellow rabbitbrush (*Chrysothamnus viscidiflorus*) also make up a significant portion of the brushfield flora. This complex collection of shrubs is commonly known as Southern Oregon Chaparral. Communities dominated by members of the rose family (plums and chokecherry (*Prunus* spp.), birchleaf mountain mahogany (*Cercocarpus montanus*), and serviceberry (*Amelanchier alnifolia*) are commonly referred to as rosaceous chaparral.

Kagan and Caicco (1996) describe a western juniper-Oregon white oak woodland on south slopes and rolling hills found around Siskiyou Pass and Pilot Rock east along the California border often on deep clay, stoney soils. A similar type is found in the Oregon Gulch RNA. Western juniper and Oregon white oak co-dominant with ponderosa pine along the margins or as isolated individuals within the stand. Wedgeleaf ceanothus is the dominant shrub, although Klamath plum (*Prunus subcordata*), Brewer oak (*Quercus garryana* var. *breweri*), and serviceberry (*Amelanchier alnifolia*) are important under the oak canopy. Idaho fescue (*Festuca idahoense*), bluestem wheatgrass (*Agropyron [Pseudorogneria] spicata*), California oatgrass (*Danthonia californica*), pine bluegrass (*Poa sucunda*), and needlegrasses (*Stipa [Achnatherum] spp.*) are

dominant native grasses. However, the habitat is usually dominated by introduced alien annual grasses, including Medusahead rye (*Taeniatherium caput-medusae*), dogtail (*Cynosurus echinatus*), and various *Bromus* species. Forbs include: wooly sunflower (*Eriophyllum lanatum*), Western hawksbeard (*Crepis occidentalis*), narrowleaf desert parsley (*Lomatium triternatum*), Oregon mariposa lily (*Calochortus tolmei*), Blepharipappus (*Blepharipappus scaber*), and woolyhead clover (*Trifolium eriocephalum*). At lower elevations, yellow starthistle (*Centaurea solstitialis*) can be a significant weed. Thompson and Drewien (1983) described several range sites dominated by oaks.

Mahogany-Oak-Fescue

A typically dry site with high densities of Oregon white oak and Birchleaf mountain-mahogany. Understory predominately consists of Idaho fescue (*Festuca idahoense*) and a variety of forbs. Soils are moderately deep with clayey subsurface horizons. Most sites occur on moderately steep to steep slopes.

Oak-Pine-Fescue

This site type occurs most typically on gently rolling hills at low elevations and on steep south-facing slopes at the higher elevations. Overstory is dominated by Oregon white oak and secondary amounts of ponderosa pine. Understory is mainly Idaho fescue (*Festuca idahoense*) with minor densities of bluebunch wheatgrass (*Agropyron* [*Pseudorogneria*] *spicata*). Forbs are variable. Soils are well-drained, shallow, and rocky.

Oak-Pine-Oatgrass

Canopy cover of Oregon white oak, usually at high densities, with minor amounts of ponderosa pine. Dominant grass is California oatgrass. Soils are clayey at subsurface horizons. These sites are typically found on gentle slopes or flats at both north and south aspects.

Pine-Oak-Fescue

Overstory is dominated by ponderosa pine, Oregon white oak, and/or California black oak. Ground cover consists of high densities of Idaho fescue (*Festuca idahoense*). Mid-story may include birchleaf mountain-mahogany, serviceberry, and/or Klamath plum. Soils are moderately deep and are well-drained. Most sites occur on rolling hills, though some are found on steep slopes.

Mixed Conifer Zone/White Fir Series

At higher elevations, the Interior Valley Zone fades into the Mixed Conifer Zone. The demarcation between zones may be distinct or obscure. Douglas-fir, ponderosa pine, and other conifers become evident often with an increase in golden chinquapin (*Chrysolepis chrysophylla*), Oregon grape (*Berberis aquifolium*), baldhip rose (*Rosa gymnocarpa*), and additional ceanothus

species. There is no clear transition at higher elevations between the Mixed Conifer Zone and the White Fir Zone. The Mixed Conifer Zone is found in the Upper Tyler Creek, Baldy, Middle Jenny, Keene Creek, and Lower Jenny subwatersheds between 2,500 and 4,200 feet elevation. The Mixed Conifer Zone landscape pattern is coarse grained because of interspersed shrublands, meadows, clearcuts, and forestland.

The Mixed Conifer Zone supports a variety of conifers including Douglas-fir (*Pseudotsuga menziesii*), white fir (*Abies concolor*), ponderosa pine (*Pinus ponderosa*), sugar pine (*P. lambertiana*), incense cedar (*Calocedrus decurrens*), Pacific yew (*Taxus brevifolia*), and western juniper (*Juniperus occidentalis*). Douglas-fir is the most common conifer with sugar pine, ponderosa pine, and incense cedar also present in the overstory of mature stands. In mature stands, white fir (and Douglas-fir with enough canopy gaps) dominates other understory conifers, which indicates that it is the climax species. Before 1910, more frequent fires prevented the more flammable, shade tolerant white fir from becoming a dominant climax species at lower elevations. As a result of fire cessation, a shift toward dense stands of white and Douglas-fir at the expense of sugar pine, ponderosa pine, and incense cedar has occurred.

Much of the Mixed Conifer Zone and all of the white fir zone in the Jenny Creek LSR would be classified with Atzet et al. (1996) the white fir series made up of several white fir (ABCO) associations. White fir associations are recognized by a high rate of constancy (the percent of plots with a given species present) among understory trees. In some plant communities, Douglas-fir might have 100 percent constancy in the overstory but would be considered a white fir association because 100 percent constancy of white firs in the understory.

Atzet et al. (1996) WHITE FIR-INCENSE CEDAR/WESTERN STARFLOWER (ABCO 44). Association is particularly well represented in the LSR. Douglas-fir, white fir (*Abies concolor*), incense-cedar, and sugar pine are the main overstory trees. White fir is the main constituent among the understory trees and has increased to the detriment of the less shade tolerant sugar pine, Douglas-fir, and incense cedar with lack of fire as an important ecosystem factor. Sugar pine and incense cedar quickly fill in canopy gaps caused by blow-down white fir and Douglas-fir that have succumbed to *Phellinus weirii* and other root rot infections. Sugar pine in many associations often appears as the long-term dominant continuing to grow as generations of white fir and Douglas-fir perish from fire or root rot. Sugar pine usually occurs as isolated individuals and never in solid stands. White fir stocking levels have increased compared to other conifers in the area because of fire suppression and lack of Native American fire land management practice. Under even the lightest fire regimes, young white firs are fire sensitive because of low branches that sweep to the ground creating fuel ladders to the crowns and relatively thin resinous bark.

Kagan and Caicco (1996) recognize a Siskiyou-Sierra mixed conifer forest on the western slopes of the southern Cascades and in the eastern Siskiyou Mountains. They describe this forest as an open to closed canopy forest with numerous co-dominant conifers made up of a rich assemblage

of trees, shrubs, and forbs. The forest type varies in elevation from 2,500 to 5,500 feet. In the Jenny Creek LSR, many of the Siskiyou species mentioned drop out (Port Orford-cedar and Tanbark-oak). Diagnostic trees in the LSR include: white fir (*Abies concolor*), incense-cedar (*Calocedrus decurrens*), sugar pine (*Pinus lambertiana*), ponderosa pine (*P. ponderosa*), and Douglas-fir (*Pseudotsuga menziesii*). Shrubs include: vine maple (*Acer circinatum*), pinemat manzanita (*Arctostaphylos nevadensis*), little Oregon-grape (*Berberis nervosa*), oceanspray (*Holodiscus discolor*), baldhip rose (*Rosa gymnocarpa*), creeping snowberry (*Symphoricarpos mollis*), and western yew (*Taxus brevifolia*). Forbs include: vanilla-leaf (*Achyls triphylla*), threeleaf anemone (*Anemone deltoidea*), spreading dogbane (*Apocynum androsaemifolium*), bigleaf sandwort (*Moehringia* [*Arenaria*] *macrophylla*), prince's-pine (*Chimaphila umbellata*), Hooker fairybells (*Disporum hookeri*), rattlesnake-plantain (*Goodyear oblongifolia*), whiteflower hawkweed (*Hieracium albiflorum*), slendertube iris (*Iris chrysophylla*), twinflower (*Linnaea borealis*), oneside wintergreen (*Pyrola secunda*), starflower solomonseal (*Smilacina stellata*), western starflower (*Trientalis latifolia*), evergreen violet (*Viola sempervirens*), Whipplevine (*Whipplea modesta*), and bear-grass (*Xerophyllum tenax*). Other species are trees, such as the bigleaf maple (*Acer macrophyllum*), madrone (*Arbutus menziesii*), and chinquapin (*Chrysolepis chrysophylla*); shrubs include: greenleaf manzanita (*Arctostaphylos patula*), the Oregon-grapes (*Berberis aquifolium*, *B. nervosa*), pinemat manzanita (*Arctostaphylos prostratus*), hairy honeysuckle (*Lonicera hispidula*), and poison-oak (*Rhus diversiloba*).

Elements of Kagan and Caicco's (1996) Douglas-fir - ponderosa pine - incense-cedar forest are present. This lower to middle-montane forest has a closed to open canopy. Douglas-fir is commonly the dominant tree although other conifers may be present. It is found along the western slopes of the southern Oregon Cascades between 2,000-3,500 feet elevation.

Thompson and Drewien (1983) distinguished the following conifer forest range types.

Douglas-fir Forest

Overstory is dominated by Douglas-fir with California black oak and madrone. Ponderosa pine is present in minor amounts. Grasses consist mainly of western fescue (*Festuca occidentalis*), mountain brome (*Bromus*), and California fescue (*Festuca californica*). Site type is typically found on deep to moderately deep soils on north slopes (sometimes south slopes).

Douglas-fir/Mixed Pine

Douglas-fir dominates the overstory with sugar pine (*Pinus lambertiana*) and ponderosa pine present. Western fescue (*Festuca occidentalis*), Alaska onion-grass (*Melica subulata*), and California brome (*Bromus carinatus*) are chief understory species. Soils are moderately deep and high in iron, sometimes stoney and gravelly throughout the profile. Sites occur on nearly flat to steep slopes, usually south-facing slopes.

Mixed Fir-Oceanspray

White fir is the dominant species, although Douglas-fir is found at high densities in this site type. Pines are scarce. Oceanspray is the dominant mid-story species. Mountain brome (*Bromus marginatus*), western fescue (*Festuca occidentalis*), and Alaska onion-grass (*Melica subulata*) are predominant understory grasses. Most sites are on moderately steep, north slopes. Soils are deep with a loam surface horizon and clay loam subsurface.

White Fir Forest

White fir (*Abies concolor*) is the dominant species. Other conifers are scarce. Alaska onion-grass (*Melica subulata*), Ross sedge (*Carex rossii*), and mountain brome (*Bromus marginatus*) are significant grasses in the understory. Sites may be on flats or steep slopes. Soils are usually deep clay loams, although some sites are stoney throughout the profile.

Franklin and Dryness (1973) describe the White Fir Zone as a narrow belt located at the upper margin of the Mixed Conifer Zone. In southwestern Oregon, this zone is not as clearly separated from adjacent vegetative zones as it is in other regions in the state. In the Jenny Creek LSR, there is a gradual transition from the Mixed Conifer Zone to the White Fir Zone beginning at the 4,200 foot elevation. The White Fir Zone becomes clearly recognizable above 5,000 feet around Hyatt Lake and on Table, Chinquapin, Soda, Porcupine and Hobart mountains. It occupies most of the higher elevation areas. The White Fir Zone differs from the Mixed Conifer Zone by having significant winter snow accumulations. Consequently, vegetation suffers less stress from lack of moisture. This zone is found within the Upper Jenny Creek, Middle Jenny, and Keene Creek subwatersheds. The landscape pattern of this zone is more fine grained than the previous vegetation zones; numerous clearcuts, meadows, and rock outcrops are present in the landscape.

The White Fir Zone is characterized by extensive stands of coniferous forest interspersed with wet meadows. White fir is the major tree species and may occur as pure or nearly pure stands. In areas where there is a mixture with other conifers, Douglas-fir is the most common associate. Sugar pine, ponderosa pine, and incense cedar may also be present. Ponderosa pine, Jeffrey and lodgepole pine have been used extensively in plantations as they are more tolerant of the severe frost conditions than some other species such as Douglas-fir. Lodgepole pine is also found as a pioneer species occurring naturally, particularly on the edges of frostprone meadows. It was likely more common during the little ice age of the 19th century.

Mixed Fir Forest

Similar to the Mixed Fir-Oceanspray site, dominance of understory by oceanspray is not evident. Understory is shared Rocky Mountain maple (*Acer glabrum*), deerbrush, serviceberry, and hazelnut (*Corylus cornuta* var. *californica*). Sites have deep clay loam soils on steep north-facing slopes.

Shasta Fir Forest

This site type is absent from the Jenny Creek LSR.

Grasslands

Listed below are five grassland types (Thompson and Drewien 1983).

Steep Foothill Grassland

Bluebunch wheatgrass (*Agropyron* [*Pseudorogneria*] *spicata*) dominate the site with variable amounts of Idaho fescue (*Festuca idahoense*) and Lemmon needlegrass (*Stipa* [*Achnatherum*] *lemmonii*). Sites occur on shallow soils on south-facing slopes that exceed 40 percent. Elevation ranges from 1,800 to 4,000 feet.

Steep Mountain Grassland

Idaho fescue (*Festuca idahoense*) dominates the site with variable amounts of bluebunch wheatgrass (*Agropyron* [*Pseudorogneria*] *spicata*) and Lemmon needlegrass (*Stipa* [*Achnatherum*] *lemmonii*). Sites are located on steep (over 40 percent) south-facing slopes with shallow, rocky soils. Elevation varies from 3,000 to 5,500 feet.

High Mountain Grassland

Variable amounts of Idaho fescue (*Festuca idahoense*) and Lemmon needlegrass (*Stipa* [*Achnatherum*] *lemmonii*) dominate the sites, with minor amounts of bluebunch wheatgrass (*Agropyron* [*Pseudorogneria*] *spicata*). High snow fall areas. High elevation (above 5,000 feet) with shallow rocky soils similar to Steep Mountain and Steep Foothill Grassland sites.

Dry Meadow

Flatter sites on moderately deep soils with a high shrink swell capacity. Ground vegetation consists of California oatgrass (*Danthonia californica*), pine bluegrass (*Poa secunda* [*P. scabrella*]), and various forbs. Meadow sites with scant canopy cover. Elevation varies from 1,600 to 6,000 feet.

Semi-Wet Meadows

Sites are located on flats under semi-wet conditions. Moderately deep, clay-loam soils are poorly drained. Graminoids dominated by California oatgrass (*Danthonia californica*) and meadow sedge (*Carex praticola*). Swamp buttercup (*Ranunculus orthorhynchus*) is usually the dominant forb. Elevation varies.

Riparian Vegetation

As defined here, riparian vegetation grows where adequate water from nearby streams and small ponds or a high water table can support a characteristic terrestrial broadleaf deciduous plant community along their margins. These species cope with the long, dry summers of the Jenny

Creek LSR by growing where there is adequate water to meet their transpirational needs throughout the dry period.

Typical trees include: Oregon white alder (*Alnus rhombifolia*), black cottonwood (*Populus balsamifera* var. *trichocarpa*), Oregon ash (*Fraxinus latifolia*), and bigleaf maple (*Acer macrophyllum*).

Commonly encountered shrubs are mock-orange (*Philadelphus lewisii*), willow species (*Salix* spp.), Douglas spiraea (*Spiraea douglasii*), ninebark (*Physocarpus capitatus*), Indian-plum (*Oemleria cerasiformis*), and Douglas hawthorn (*Crataegus douglasii*).

Aquatic Vegetation

Aquatic vegetation consists of those species that grow in or near still or flowing water and may be free-floating or attached and/or emergent. Free-floating species include various duckweeds and their relatives (*Lemna*, *Spirodela*, and *Wolffia*). These tiny plants float on the surface of ponds and in still water of flowing streams. Common attached floating vegetation consists of water-star wort (*Callitriche* sp.), waterweed (*Elodea*), various species of pondweed (*Potamogeton*), water smartweed (*Polygonum amphibium*), and Indian pond-lily (*Nuphar polysepalum*). Emergent species include: cattail (*Typha latifolia*), bulrush (*Scirpus* sp.), spike-rush (*Eleocharis* sp.), and bur-reed (*Sparganium* sp.), and water pliantain (*Alisma* sp.). These species occur at different places in the Jenny Creek LSR (in streams, stockponds, and the Parsnip Lakes) depending on current water depth and substrate.

There are numerous open, wet areas in the LSR that support a variety of characteristic forbs depending on soils, hydrology, and seasonality and duration of soil moisture in addition to the semi-wet meadows described Thompson and Drewien (1983). Some open areas with a continuous water supply for much of the growing season support extensive open areas dominated by California false-hellebore (*Veratrum californicum*), with nettle-leaf giant hyssop (*Agastache urticifolia*), parsley-leaf licorice-root, alpine timothy (*Phleum alpinum*), Columbia brome (*Bromus vulgaris*), showy onion-grass (*Melica spectabilis*), lupines, paintbrushes, and owl-clover.

Meadows in the White Fir Zone frequently have islands of white fir in them. The white fir in these islands form compact, densely stocked units where crowns extend to the tree base on the outer meadow edge. The interiors of these tree groups are protected from wind exposure and moisture extremes. A moist, shady microclimate is maintained that is beneficial to tree and stand vigor and that is preferred habitat for many wildlife species.

Some openings in the white fir forest are maintained by late melting snow fields. These openings are important as the main habitat for Klamath lambs-tongue (*Erythronium klamathense*), an endemic species known mostly from the Southern Cascade and Klamath River

Ridges Ecoregions. Yellow-bells (*Fritillaria pudica*), also abundant in these openings, is an example of an east of the Cascade species that points to the importance of the LSR from the standpoint of connectivity. Yellow-bells reaches its western most distribution in the Rogue River Valley.

The wet lands associated with patterned ground and vernal pools support a diverse and biologically important flora. As vernal pools dry seasonally, they undergo a series of transformations with one set of species replacing another. These vernal pools are characterized by species. Howell quillwort (*Isoetes howellii*), least mouse-tail (*Myosurus minimus*), mountain navarretia (*Navarretia intertexta*), downingia (*Downingia elegans*), and various species of popcorn-flowers (*Plagiobothrys* spp.). The most significant species is Bellinger meadowfoam (*Limnanthes flocosa* var. *bellingiana*), a Federal Species of Concern and ONHP Level 1 species is discussed further under Plant Species with Special Status.

Plant Community Dynamics

Plant communities are not static. They are in a state of constant change caused by shifting abiotic and biotic conditions over time. Plant communities may occupy several conditions identified by different plant species abundances. Change from one state to another may be dependent on particular forces (e.g., fire history (including lack of fire), herbivory and livestock impact, timber harvest, and road construction). Current ecological theory implies that plant communities move through multiple pathways towards a range of states.

The following discussion describes some of the plant community dynamics thought to occur in Jenny Creek LSR grasslands, shrublands, woodlands, mixed conifer and white fir forests.

Grasslands and Shrublands

Much of the southern area of the Jenny Creek LSR is characterized by open grasslands. The open character (lack of woody tree and shrub species) of these grasslands may be due to high fire frequency in the past and/or edaphic conditions. Several grassland types are prevalent within the Jenny Creek LSR (SCS 1993). In reality, the different grasslands share similar characteristics and merge with shrubland and woodland types. In some cases, these plant communities could be considered to be alternative site occupiers.

The SCS (1993) Potential Natural Community framework fails to demonstrate the conversion of much of the perennial dominated grasslands to annual grasslands dominated by medusahead (*Taeniatherum asperum*), cheatgrass (*Bromus tectorum*), annual fescue (*Vulpia* spp.), and hairgrass (*Aira caryophylla*). Large areas have also been converted to yellow starthistle. The introduction of these exotic weeds together with altered fire regime and past improper livestock management, have created the circumstances for large-scale analyzation.

Very few examples of successful restoration of annualized grasslands exist. The presence of annual grasses and forbs creates an altered ecosystem favoring continued domination by the same annual weeds (Figure A-1). Cheatgrass and medusahead are winter annuals that germinate in fall and winter and are capable of root growth below the tolerable temperature range for native perennial grasses. Weed grasses monopolize nutrient and water resources early in the spring growing season. Thus annual grasses complete their life-history cycle early causing slower maturing native grasses, deprived of optimum water and nutrients, to senesce prematurely without producing seed. In the Great Basin and Columbia River Basin, the fine fuel provided by cheatgrass and medusahead is also blamed for early summer fire at a time when native grasses are still green and sensitive to flames. Early fire causes a further reduction in perennial grass basal area, preventing seedset. Where fire does not occur, the high silica content of medusahead retards decomposition, resulting in a thick litter layer. Native forb and grass seeds are unable to germinate and penetrate this litter barrier to mineral soil.

Increased woodiness with fire suppression is one of the few biological principles to rely upon. High canopy cover may suppress many desired herbaceous plant species. Many plant species have shorter lived seeds, or may require fire for germination. Long-term fire suppression may thus prevent the replenishment of the seedbank and filter out an important component of herbaceous plants.

Grassland and shrubland plant community dynamics are influenced by a number of factors including fire history, herbivory, weeds, the biology of individual species (germination factors, longevity, reproductive strategies), and time. Depending on events, grasslands and shrublands may be dominated by native herbaceous species, shrubs and/or weeds.

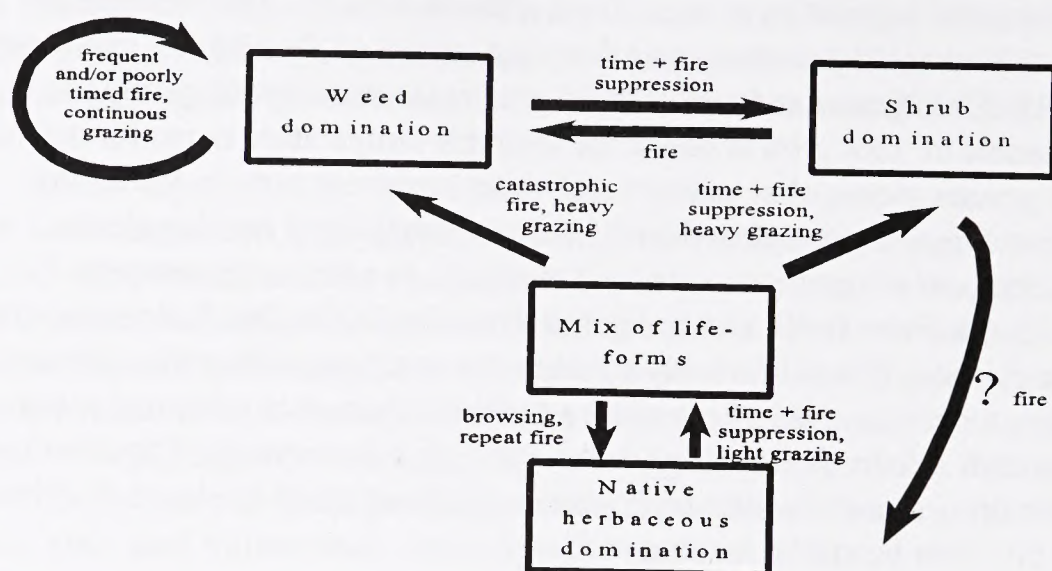


Figure A-1. Grassland and Shrubland Plant Community Dynamics

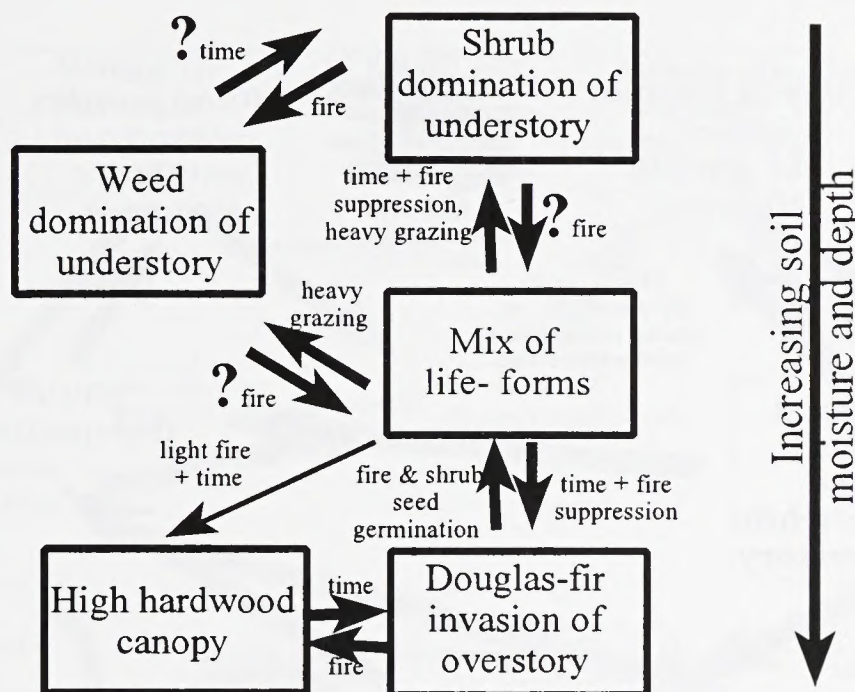


Figure A-2. Woodland Community Dynamics

Woodlands

The most common hardwood species on the landscape are Oregon white oak, California black oak, and birchleaf mountain mahogany. While some stands may show dominance by a particular hardwood species, a mixture is the norm. Ponderosa pine, western juniper, incense cedar, and Douglas-fir are also prominent, and may even achieve co-dominance depending on fire history and aspect. Figure A-2 defines some of the important woodland community dynamics found within the Jenny Creek LSR.

Woodlands consist of a mixture of life-forms (grasses, forbs, shrubs, and trees) and functional groups suited to site and current vegetation conditions. Functional groups include nitrogen-fixing plants, opportunistic pioneer plants, deep-rooted perennial grasses/forbs, and other plant groups required for the maintenance of the oak woodland ecosystem.

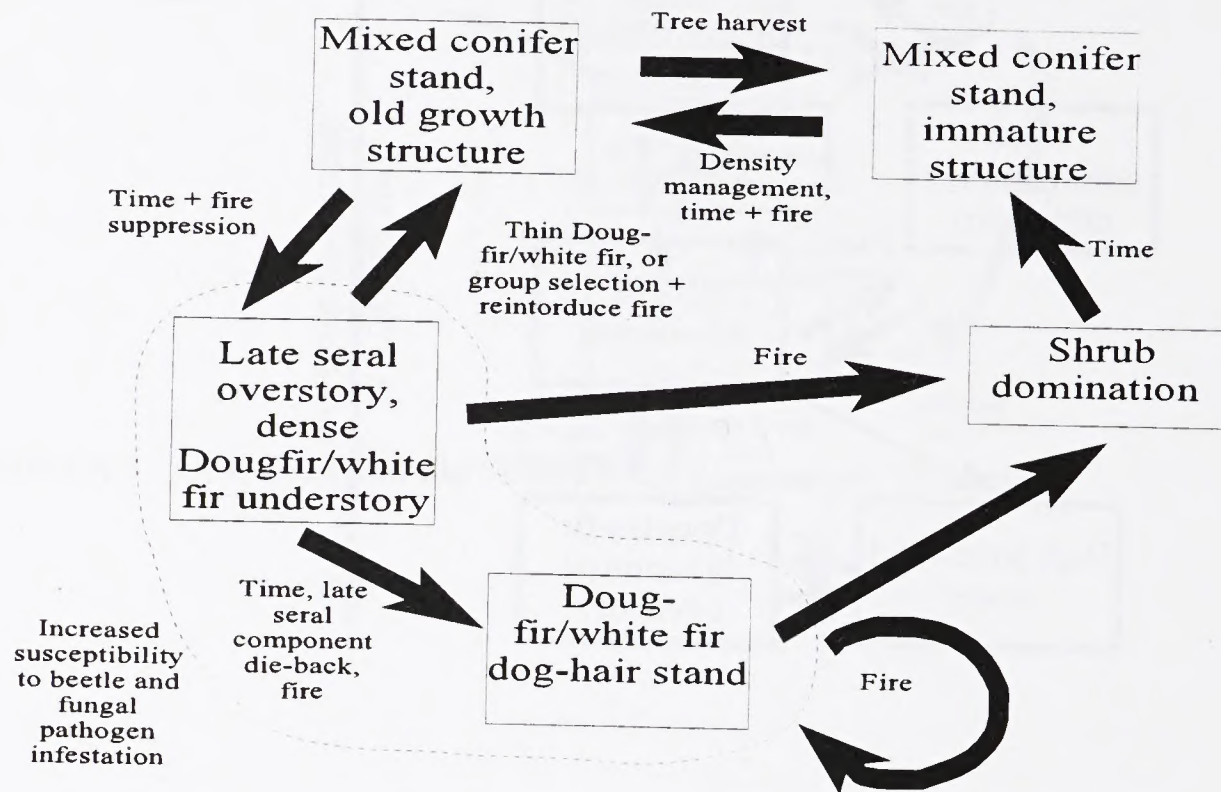


Figure A-3. Mixed Conifer Plant Community Dynamics

Factors that influence hardwood plant community dynamics are time, fire history, disturbance (herbivory), edaphic factors, and invasion by alien species. The interaction of the factors result in changes in the landscape between a mix of life forms or domination of the various layers by shrubs, hardwoods, Douglas-fir, and/or weeds.

Mixed Conifer Forests

Fire plays an important role in the development and maintenance of the range of mixed conifer plant communities (Figure A-3). Many present-day mixed conifer sites show overcrowding by a dense Douglas-fir and/or white fir understory. This follows fire suppression or overstory tree canopy reduction. The reintroduction of fire in conifer communities with a dense understory results in catastrophic fire, introducing an undesired fire cycle leading to dog-hair stands or dense brush. States including dense Douglas-fir and/or white fir understories are more susceptible to beetle and fungal pathogen infestation. In many cases, this can result in the loss of the remaining late seral component.

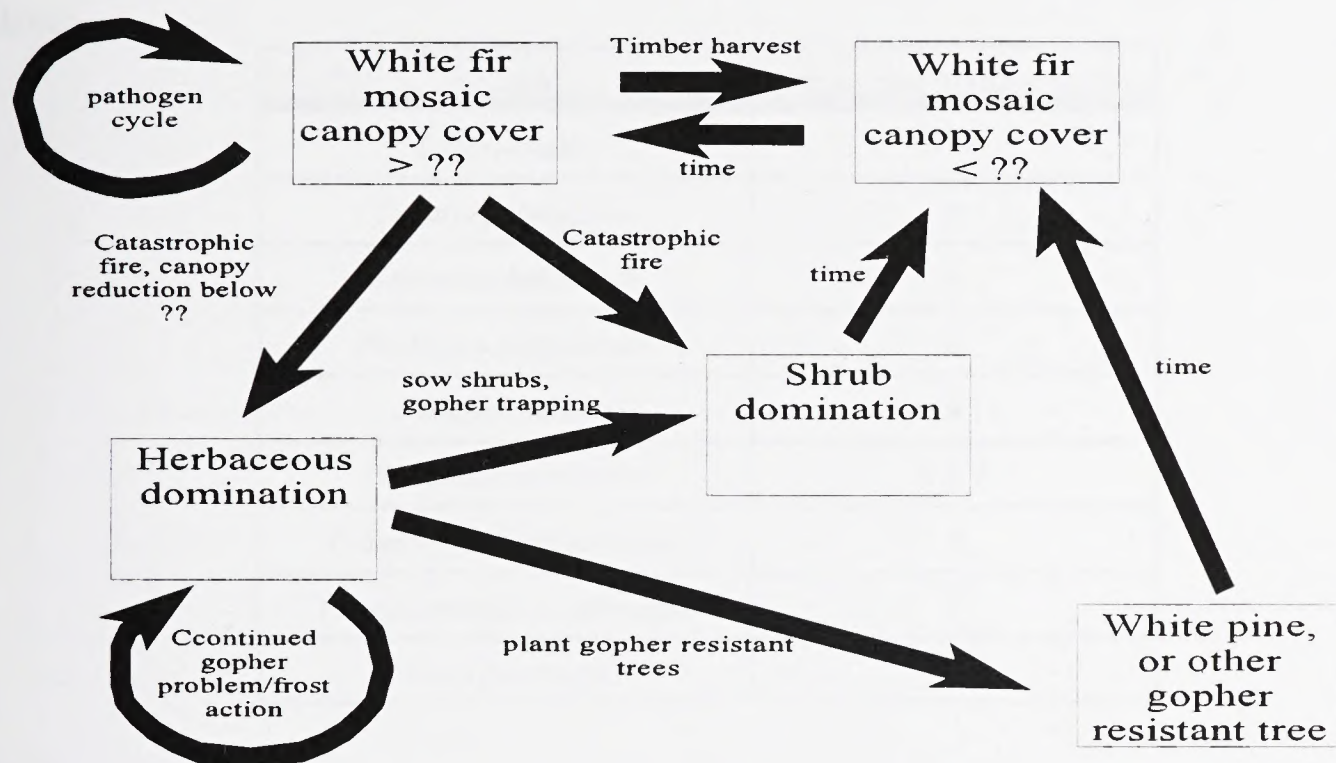


Figure A-4. White Fir Community Dynamics

White Fir Forests

Where white fir predominates at higher elevations and on northerly aspects, ecosystem function and process differ from previously discussed communities to create a temporal/spatial mosaic of white fir and incense cedar (Figure A-4). White fir are subject to several fungal pathogens that create openings in the previously white fir dominated canopy when trees die. Less susceptible species such as incense cedar and Douglas-fir then become locally established. Re-invasion by the more shade-tolerant white fir coupled with the eventual mortality of the incense cedar and Douglas fir-result in a reversion to white fir domination. This pathogen mediated cycling in plant community composition can be broken by excessive tree harvest. Older clearcuts and partial harvests may become shrub-invaded as with Douglas-fir and mixed fir communities, or suffer frost action and gopher predation. In the latter case, the restocking of some tree species becomes impossible--trees are girdled within a season after planting. As with mixed conifer, insect outbreaks can also play an important role in plant community dynamics. When fire does occur, it is usually considered to be a stand replacement event.

Appendix B

Survey and Manage Species

Lichens

Species	Survey and Manage Status
<i>Lobaria hallii</i>	1
<i>Lobaria pulmonaria</i>	4
<i>Nephroma helveticum</i>	4
<i>Nephroma resupinatum</i>	4
<i>Peltigera collina</i>	4
<i>Phycotonis ericetorum</i>	3 & 4
<i>Pseudocyphellaria anomala</i>	4
<i>Pseudocyphellaria anthraspis</i>	4
<i>Sticta fuliginosa</i>	4

Fungi

A total of six species of Survey and Manage fungi were located in the Jenny Creek LSR. *Pithya vulgaris* and *Plectania milleri* were the only Survey and Manage strategy 1 species located within the LSR boundary. All six of these species are associated with either white fir, (*Abies concolor*), white fir/Douglas-fir mix, or mixed-conifer stands above 3,500 feet in elevation. Habitat descriptions follow.

Species	Survey and Manage Status
<i>Gyromitra esculenta</i>	3 & 4
<i>Gyromitra gigas</i>	3 & 4
<i>Pithya vulgaris</i>	1 & 3
<i>Plectania milleri</i>	1 & 3
<i>Sarcosoma mexicana</i>	3
<i>Sarcosphaera eximia</i>	3

Gyromitra esculenta. Occurs in young to mid-mature (<100-200+years) white fir/Douglas-fir and mixed conifer stands, elevation ranges from 4,000-5,000 feet on slopes of <25 percent with a

relatively high tree cover of 80+/-20 percent, a low graminoid and forb cover of <5 percent and a highly variable shrub cover of 0-40 percent. Commonly associated species include serviceberry (*Amelanchier alnifolia*) and trail plant (*Adenocaulon bicolor*).

Gyromitra gigas. Occurs in early to mid-mature (100-200+ years) white fir and white fir/Douglas-fir stands, elevation ranges from 4,500-5,000 feet, on slopes of <40 percent with a moderately high tree cover of 63+/-14 percent, and a highly variable shrub and herbaceous layer. Commonly associated species include: dwarf Oregon grape (*Berberis nervosa*), western prince's pine (*Chimaphilla umbellata*), and blue wildrye (*Elymus glaucus*).

Pithya vulgaris. Occurs in young to mature (<100-250+ years) white fir and white fir/Douglas-fir stands, elevation ranges from 4,500-5,400 feet on slopes of <40 percent with a highly variable herbaceous layer, and a total tree cover of 66+/-9 percent. Commonly associated species include: dwarf Oregon grape, round-leaved Synthesis (*Synthesis reniformis*), and blue wildrye.

Plectania milleri. Occurs in young to early mature (<100-100+ years) white fir/Douglas-fir and mixed conifer stands, elevation ranges from 4,200-4,700 feet on slopes of 5 to 10 percent with a highly variable shrub and herbaceous layer and a total tree cover of 77+/-16 percent. Commonly associated species include: snowberry (*Symphoricarpos mollis*) and western prince's pine.

Sarcosoma mexicana. Occurs in early mature to mature (100+- 250+ years) white fir and white fir/Douglas-fir stands, elevation ranges from 4,400-5,400 feet on slopes of <50 percent with a total tree cover of 60+/-5 percent, and a highly variable shrub and herbaceous layer. Commonly associated species include: dwarf Oregon grape, western prince's pine, and round-leaved Synthesis.

Sarcosphaera eximia. Occurs in young to mid-mature (<100-200+ years) white fir/Douglas-fir and mixed conifer stands, elevation ranges from 4,000-4,600 feet on slopes <25 percent with a tree cover of 71+/-8 percent, and highly variable shrub and herbaceous layer. Commonly associated species include: dwarf Oregon grape, snowberry, trail plant, and western fescue (*Festuca occidentalis*).

Appendix C

Non-Native Plants

Non-Native Forbs

Scientific Name	Common Name	Scientific Name	Common Name
<i>Alyssum alyssoides</i>		<i>Lotus corniculatus</i>	bird's foot trefoil
<i>Anthemis cotula</i>	mayweed	<i>Lythrum salicaria</i>	purple loosestrife
<i>Brassica nigra</i>	field mustard	<i>Melilotus alba</i>	white sweet-clover
<i>Capsella bursa-pastoris</i>	Shepard's purse	<i>Mentha pulegium</i>	pennyroyal
<i>Centarium umbellatum</i>	Century plant	<i>Plantago lanceolata</i>	English plantain
<i>Cerastium viscosum</i>	field chickweed	<i>Prunella vulgaris</i>	heal-all
<i>Chenopodium botrys</i>	Jerusalem-oak goosefoot	<i>Rubus discolor</i>	Himalayan blackberry
<i>Cichorium intybus</i>	chicory	<i>Rumex acetosella</i>	sheep sorrel
<i>Conyza canadensis</i>	horseweed	<i>Sonchus asper</i>	prickly sow-thistle
<i>Daucus carota</i>	Queen Anne lace	<i>Taraxacum officinale</i>	dandelion
<i>Dianthus armeria</i>	Deptford pink	<i>Torillis arvensis</i>	Hedge Parsley
<i>Dipsicus sylvestris</i>	teasel	<i>Tragopogon dubious</i>	yellow salsify
<i>Erodium cicutarium</i>	filaree	<i>Tragopogon porrifolius</i>	blue salsify
<i>Geranium molle</i>	dovefoot geranium	<i>Trifolium dubium</i>	little hop clover
<i>Hypochaeris radicata</i>	false-dandelion	<i>Trifolium pratense</i>	red clover
<i>Lactuca saligna</i>	least lettuce	<i>Verbascum blattaria</i>	moth mullein
<i>Latuca serriola</i>	prickly lettuce	<i>Verbascum thapsus</i>	flannel mullein
<i>Leucanthemum vulgare</i>	oxeye daisy	<i>Vicia sativa</i>	common vetch

Non-Native Perennial Grasses

Scientific Name	Common Name	Scientific name	Common Name
<i>Agropyron intermedium</i>	intermediate wheatgrass	<i>Holcus lanatus</i>	velvet-grass
<i>Agrostis tenuis</i>	colonial bentgrass	<i>Lolium perenne</i>	perennial rye
<i>Dactylis glomerata</i>	orchard grass	<i>Phleum pratense</i>	timothy
<i>Festuca arundinaceae</i>	tall fescue	<i>Poa pratense</i>	Kentucky bluegrass

Non-Native Annual Grasses

Scientific Name	Common Name	Scientific Name	Common Name
<i>Aira caryophyllea</i>	silver hairgrass	<i>Hordeum marinum</i>	Mediterranean barley
<i>Bromus mollis</i>	soft brome	<i>Lolium multiflorum</i>	annual ryegrass
<i>Bromus rigidus</i>	ripgut brome	<i>Poa bulbosa</i>	bulbous bluegrass
<i>Bromus tectorum</i>	cheatgrass	<i>Taeniatherum asperum</i>	medusahead rye
<i>Cynosurus echinatus</i>	hedgehog dogtail	<i>Vulpia myuros</i> var. <i>hirsuta</i>	foxtail vulpia

Appendix D

Noxious Weeds

Table D-1. Existing and potential noxious weeds of the Jenny Creek LSR

EXISTING		
Scientific Name	Common Name	Description
<i>Taeneantherum asperum</i> [<i>Elymus caput-medusae</i> , <i>T. caput-medusae</i>]	Medusahead Wildrye	An annual grass that can cause mechanical injury to grazing animals because of its sharp awns, and can form a carpet on the soil surface that can interfere with perennial grass germination; many annual grasses compete strongly, lower range quality, ecosystem functionality, and slow progression in ecological condition. Cultural and physical control methods are now in use on BLM rangelands.
<i>Centaurea solstitialis</i>	Yellow starthistle	An ubiquitous annual that blooms from July through September. Seeds can germinate in fall, winter, or spring. This aggressive species spreads rapidly. Horses feeding on the plant can develop "chewing disease," which can be fatal. Biological agents (the seed fly, <i>Urophora sirunaseva</i> , and the seed weevil, <i>Bangasternus orientalis</i>) were released in Jackson County in 1985 and 1987, respectively. The Yellowstar Flower Weevil (<i>Laurinus curtus</i>) was released in the Pilot Rock area in 1998.
<i>Centaurea diffusa</i>	Diffuse Knapweed	A diffusely branched annual or short-lived perennial that flowers from July to September. Diffuse knapweed infests roadsides, waste areas, and dry rangelands. This highly competitive plant, threatens to exclude many desirable species. Plants have been reported southwest of Howard Prairie Reservoir and near Johnson Creek.
<i>Centaurea pratensis</i>	Meadow Knapweed	This perennial species is considered to be a hybrid between brown knapweed (<i>C. Jacea</i> L.) and black knapweed (<i>C. nigra</i> L.). Meadow knapweed infests roadsides, waste areas, fields and pastures. It has been reported 3 miles southeast of Hyatt Lake.
<i>Centaurea maculosa</i>	Spotted Knapweed	Spotted Knapweed readily establishes on disturbed soils and has been reported just south of Hyatt Lake.
<i>Cirsium arvense</i>	Canada Thistle	A creeping perennial that is difficult to control because of its aggressive, extensively branched rhizome system that may extend as deep as 2.5 feet. It reproduces asexually by rhizome division. Canada thistle stems are smooth instead of spiny and "winged" as are the stems of Scotch or bull thistles.

EXISTING		
Scientific Name	Common Name	Description
<i>Isatis tinctoria</i> L	Dyer's Woad	A winter annual, biennial, or short-lived perennial. This European weed first appeared in the U.S. in colonial times. Its thick tap root may exceed 5 feet in depth. "Pulling" or "topping" are ineffectual mechanical controls, since plants will regenerate from roots. It first invades roadsides and disturbed sites then spreads to rangeland and cropland by seeds during late spring to mid-summer. This plant has been recorded along Jenny Creek and in Jenny Creek tributaries.
<i>Hypericum perforatum</i>	St. Johnswort Klamath Weed	This plant causes photosensitization in light colored animals, with young being particularly susceptible. Although seldom fatal, economic losses can easily occur. Cattle and sheep normally will not consume this plant when mature, but young shoots in the spring may be eaten. Biological control agents have been very successful for this plant. It is wide-spread along road sides and in disturbed areas throughout the LSR
<i>Convolvulus arvensis</i>	Field Bindweed	A European perennial from a deep persistent taproot. Prostrate stems often climbing or forming dense tangled mats. It is difficult to eradicate because of its long, deep taproot, which can penetrate 10 feet into the soil. Seeds remain viable for up to 50 years.
<i>Cuscuta campestris</i> <i>Yuncker</i>	Field Dodder	A parasitic plant that has been identified using <i>Ceanothus cuneatus</i> as a host plant. Its small root system disappears once the plant becomes established on a host plant. Seeds are long lived and infestations may occur in areas where host plants have not grown for several years.

POTENTIAL While not yet established on the LSR, these species may quickly encroach.		
Scientific Name	Common Name	Description
<i>Chondrilla juncea</i> <i>Lygodesmia juncea</i>	Rush Skeletonweed; Skeletonweed	These two genera closely resemble each other in appearance and habitat. They generally inhabit well-drained, light textured soils along roadsides, in rangelands, grain fields, and pastures. These species are not controlled by most herbicides and are increasing in density in many areas. Closest BLM siting is in the Antelope Creek Area of Little Butte Creek watershed. However, "skeletonweeds" have been seen along I-5 from Ashland to Gold Hill.
<i>Euphorbia esula</i>	Leafy Spurge	Leafy Spurge may have been spotted in the Little Butte Creek watershed (Salt Creek area). Monitoring will begin summer 1997.
<i>Linaria dalmatica</i>	Dalmation Toadflax	A perennial introduced from southeastern Europe as an ornamental reproduces by seed and underground root stalks. It is aggressive and may be found along roadsides and on rangeland where it may become a serious problem by crowding out desirable forage. An extensive and deep root system along with a waxy leaf make this an extremely difficult plant to control. Known from the Keno Access Road area, which is also access to the northern tier of the Jenny Creek LSR. Since this plant is easy to mistake for <i>Verbascum blateria</i> from a distance and <i>Verbascum</i> is becoming ubiquitous in the LSR area, it may already be present but simply overlooked or mis-identified.
<i>Linaria vulgaris</i>	Yellow Toadflax (AKA: Butter'n'eggs)	A creeping perennial aggressive Eurasian invader of rangelands introduced to the U.S. in the mid-1800s as an ornamental. It can displace desirable grasses. An extensive root system makes this plant difficult to control. Known from the Keno Access Road area, which is also access to the northern tier of the Jenny Creek LSR. Since this plant is easy to mistake for <i>Verbascum blateria</i> from a distance and <i>Verbascum</i> is becoming ubiquitous in the LSR area, it may already be present but simply overlooked or mis-identified.
<i>Cytisus scoparius</i>	Scotch Broom	Present on the Medford District, but appears to be a distant threat in the LSR. No reports closer than the Lost Creek Lake area.
<i>Spartium junceum</i>	Spanish Broom	Present on the Medford District, but appear to be a distant threat in the LSR. No reports closer than the Lost Creek Lake area.

Appendix E

Special Status Wildlife Species Not Associated with Late-Successional Habitat

Birds

Bald Eagle (*Haliaeetus leucocephalus*)

The bald eagle is listed as a threatened species under the auspices of the ESA. Bald eagles are closely associated with larger bodies of water where they find optimal forage and nesting conditions. There is one active bald eagle nest sites in the Jenny Creek LSR. This nest is associated with Howard Prairie Reservoir. There are three historic sites outside the LSR proximate to Howard Prairie reservoir.

The Preferred Alternative in the Medford District Resource Management Plan specifies that a block of suitable habitat at least 30 acres in size be designated for future population expansion near the shoreline of Hyatt Reservoir. This block has not been officially designated yet, but it will be before any actions that might limit selection options are undertaken.

Peregrine Falcon (*Falco peregrinus*)

The peregrine falcon is listed as an endangered species under the auspices of the ESA; however, an announcement of its de-listing is forthcoming. There are no known peregrine falcon nest sites in the Jenny Creek LSR; however, there have been reported sightings of peregrine falcons in the Jenny Creek canyon (outside the LSR) and the cliffs along the rim of lower Jenny Creek canyon provide potential nesting habitat. The only site in the LSR with any real potential for nests is Hobart Bluff. This site has a high traffic road running past the base of the cliff and there is a branch trail off of the PCT that goes to the top of the cliff; both of these attributes detract from the suitability of the site.

Lower Jenny Creek canyon (adjacent to the LSR) was inventoried for peregrine falcons in 1992 and 1994. No peregrines were observed. Peregrine falcons could potentially be impacted by management activities aimed at producing and maintaining late-successional habitat on the LSR lands unless appropriate protection measures were implemented.

Lewis' Woodpecker (*Asyndesmus lewis*)

Lewis' woodpecker is a Bureau assessment species. This species is found most commonly in the Interior Valley Zone. This species is closely associated with mature oak woodlands and oak savannah habitat. Any population of Lewis' woodpeckers in the LSR is believed to be almost exclusively a wintering population. There may be some nesting by this species, but there is little data on non-winter observations. This species is not likely to be impacted by management activities aimed at producing and maintaining late-successional habitat on the LSR lands.

Greater Sandhill Crane (*Grus canadensis*)

The greater sandhill crane is a Bureau assessment species. Primary habitat for both nesting and foraging is wet meadows. There have been a number of sightings of this species in the meadows and grasslands near Hyatt and Howard Prairie reservoirs and Fredenberg Springs, but there has not been confirmed nesting within the LSR. There has not been any systematic inventory for greater sandhill cranes in the LSR.

This species is not likely to be impacted by management activities aimed at producing and maintaining late-successional habitat on the LSR lands. The areas where this species nests and forages are too wet to support late-successional habitat.

Northern Saw-whet Owl (*Aegolius acadicus*)

The northern saw-whet owl is a Bureau assessment species. Primary habitat is dense conifer forest intermixed with meadows in the Mixed Conifer and White Fir Zones. Little is known about this owl in the LSR. Some have been aurally and visually detected coincidentally with inventories for northern spotted owls.

It is unclear what if any effect management for the development of late-successional habitat would have on this species.

Western Meadowlark (*Stunella neglecta*)

The western meadowlark is a Bureau assessment species, which is rarely found in the LSR. Primary habitat in southwest Oregon is large natural meadows and grasslands. Little is known about population trend in the LSR.

This species could potentially be impacted by development of late-successional habitat (conifer encroachment) where open, grassy meadows once were.

Western Bluebird (*Sialia mexicana*)

The western bluebird is a Bureau assessment species found throughout the LSR. Primary habitat is naturally occurring open areas or early seral conifer forest. Little is known about population trend within the LSR. Cavities in trees and snags occurring in open areas are natural nest sites. A number of nest boxes to encourage nesting by western bluebirds have been erected in the LSR over the last few years.

This species could potentially be impacted by development of late-successional habitat where open, grassy meadows once were.

White Pelican (*Pelicanus erythrorhynchos*)

The white pelican is a Bureau assessment species. It has been observed in various sized groups on Hyatt Reservoir for approximately the past six summers. Little is known about this summer

population other than that it is nonbreeding and assumed to be from the Klamath basin. The pelicans remain for a relatively short time - several weeks to a couple of months.

This species is not likely to be impacted by management activities aimed at producing and maintaining late-successional habitat on the LSR lands.

Reptiles and Amphibians

Western Pond Turtle (*Clemmys marmorata*)

The western pond turtle is a Bureau-sensitive species. Preferred habitat is ponds or streams with abundant aquatic vegetation, basking structure (rocks and/or logs), and adjacent terrestrial habitat suitable for nesting and overwintering (Holland personal communication 1993). They are generally found below 3,600 feet in elevation. There are several known populations within the LSR.

Preferred nesting habitat is dry, compacted clay soil on a southern aspect. Western pond turtles generally overwinter under the duff layer of a tree or shrub. They have been observed (in other parts of their range) to travel up to 300 meters from water to find overwintering sites. Some individuals have spent up to nine months at a time on dry land. Consequently, this species is at least somewhat dependant on upslope conditions as well as in-stream conditions.

A monitoring program for two populations in Jenny Creek was initiated in 1994.

This species could potentially be impacted by management activities aimed at producing and maintaining late-successional habitat on the LSR lands, unless appropriate protection measures were implemented. This species could also be impacted by loss of nesting habitat through natural encroachment of conifers into grassy riparian habitat.

Cascade Frog (*Rana cascadae*)

The cascade frog is a Bureau assessment species. Preferred habitat is mountain meadows characterized by the presence of marsh marigold and small ponds or potholes with little aquatic vegetation. This species is known from at least one location in the LSR.

This species could potentially be impacted by loss of habitat through natural encroachment of conifers into open canopy, grassy riparian habitat.

Tailed Frog (*Ascaphus truei*)

The tailed frog is a Bureau assessment species. Preferred habitat is fast-flowing, cold, perennial streams in forested areas of the Mixed Conifer and White Fir zones. There are no known records, but this species is likely present in the LSR. There have been no extensive inventories for this species in the LSR.

This species could potentially be impacted by management activities aimed at producing and maintaining late-successional habitat on the LSR lands unless appropriate protection measures were implemented in the Riparian Reserves. If these measures are adhered to in the short term, the development of late-successional habitat in Riparian Reserves in the long term may benefit this species.

California Mountain Kingsnake (*Lampropeltis zonata*)

The California mountain kingsnake is a Bureau assessment species. This species is known to occur in the LSR, but nothing is known about populations. Preferred habitat is oak-woodland and mountain chaparral plant communities in the Interior Valley and Mixed Conifer Zones.

It is unclear what if any effect management for the development of late-successional habitat would have on this species.

Common Kingsnake (*Lampropeltis getulus*)

The common kingsnake is a Bureau assessment species. There are no records, but this species is likely present in the LSR. Preferred habitat is riparian vegetation along streams in the Interior Valley Zone.

It is unclear what if any effect management for the development of late-successional habitat would have on this species.

Mammals

Townsend's Big-eared Bat (*Plecotus townsendii*)

The Townsend's big-eared bat is a Bureau sensitive Survey and Manage and protection buffer species. Preferred habitat is caves and abandoned mines. There are no known records of this species being present in the LSR, but the rimrock/cliffs of the lower canyon (adjacent to the LSR) likely provide suitable habitat (caves). Townsend's big-eared bats have been found in the Klamath Canyon, which is nearby.

This species is not likely to be impacted by management activities aimed at producing and maintaining late-successional habitat on the LSR lands. It is unlikely that sites will be found in forested settings in the LSR.

Fringed Myotis (*Myotis thysanodes*)

The fringed myotis is a Bureau assessment species and is a Survey and Manage strategy 1 & 2 species in the ROD. It appears to be a habitat generalist since it is found in both forested and nonforested habitats. Caves, abandoned buildings, or other similar structures are required for nursery colonies. There are records of this species occurring in the LSR, but little is known of its distribution and abundance.

It is unclear what if any effect management for the development of late-successional habitat would have on this species.

Appendix F

Northern Spotted Owl Sites

Table F-1. Spotted owls captured and recaptured in and around the Jenny Creek LSR

Age 1	Sex	Site #	From Location		Site #	To Location	Age 2	Years Gone
F	F	0092	LSR		2404	LSR	S	1
F	F	0092	LSR		0061	LSR	S	1
F	F	3273	LSR		2404	LSR	S	2
F	M	2270	LSR		4063	LSR	A	4
F	M	0977	LSR		0891	LSR	S	3
F	M	0962	LSR		0966	LSR	S	2
F	M	0977	LSR		0092	LSR	S	2
S	M	2020	LSR		1305	LSR	S	1
A	F	2270	LSR		3278	2MI	A	2
A	M	2270	LSR		3278	2MI	A	2
F	F	962	LSR		2264	OUT	A	6
F	F	1305	LSR		0967	OUT	A	3
F	M	0061	LSR		2261	OUT	A	5
A	M	2268	2MI		2078	LSR	A	1
A	M	2268	2MI		0061	LSR	A	1
A	M	2268	2MI		2078	LSR	A	1
A	M	3278	2MI		2268	2MI	A	3
F	F	4044	OUT		0092	LSR	S	2

Age 1	Sex	Site #	From Location		Site #	To Location	Age 2	Years Gone
F	F	0010	OUT		2285	LSR	S	3
F	S	2399	OUT		4063	LSR	S	2
F	M	2262	OUT		4043	LSR	S	3
M	??	2363	OUT		3278	2MI	A	1
M	F	0066	OUT		4409	2MI	A	S
U	F	UNK	UNK		4063	LSR	S	UNK
U	F	UNK	UNK		2270	LSR	S	UNK
U	F	UNK	UNK		4061	LSR	A	UNK
U	F	UNK	UNK		0962	LSR	S	UNK
U	F	UNK	UNK		3274	LSR	A	UNK
U	F	UNK	UNK		0966	LSR	S	UNK
U	F	UNK	UNK		2404	LSR	A	UNK
U	F	UNK	UNK		0962	LSR	S	UNK
U	F	UNK	UNK		0891	LSR	A	UNK
U	F	UNK	UNK		0061	LSR	A	UNK
U	F	UNK	UNK		1305	LSR	S	UNK
U	F	UNK	UNK		2270	LSR	A	UNK
U	M	UNK	UNK		4061	LSR	A	UNK
U	M	UNK	UNK		3274	LSR	A	UNK
U	M	UNK	UNK		2270	LSR	S	UNK
U	M	UNK	UNK		4043	LSR	A	UNK
U	M	UNK	UNK		0966	LSR	UNK	UNK
U	M	UNK	UNK		0891	LSR	A	UNK
U	M	UNK	UNK		2270	LSR	A	UNK

Age 1	Sex	Site #	From Location		Site #	To Location	Age 2	Years Gone
U	M	UNK	UNK		0962	LSR	A	UNK
U	M	UNK	UNK		2285	LSR	UNK	UNK
U	F	UNK	UNK		0930	2MI	S	UNK
U	F	UNK	UNK		2268	2MI	A	UNK
U	F	UNK	UNK		2268	2MI	A	UNK
U	M	UNK	UNK		2268	2MI	A	UNK

Age 1: Age class of owl when last seen at original site.

Age 2: Age class of owl when recaptured.

Years Gone: The number of winters that passed between when the bird was last seen and recaptured.

AGE CLASS CODES

F: Fledgling

S: Subadult

A: Adult

SEX CODES

M: Male

F: Female

U: Unknown

LOCATION CODES

LSR: The site is in the LSR.

2MI: The site is within the 2-mile "doughnut" around the outside of LSR.

OUT: The site is outside of the LSR and beyond the "doughnut".

UNK: It is unknown where the bird came from.

Appendix G

NSO Activity Centers (LSOG) Stand Table Summaries

T08 - STAND TABLE BY SPECIES & DBH GROUP - Pine - Dry Douglas-fir

MEDFORD DISTRICT -INVENTORY Plots 10 SCR:W PAGE: 1
 PROJECT NAME: LSRJENNY Trees 115 CUB:S RUN DATE: 11/22/99
 TWP 40S RGE 04E SEC 17 UNIT 3272P ACRES: 110.00 EXAM DATE: 8/11/98

RMA: 525

AVERAGE UNIT CROWN CLOSURE: 73%

OI KEY NUMBERS: 123654 123663

STAND MODEL TYPE: ORGANON - HANN-SCRIVANI SPECIES TABLE :51 ASHLAND

STRATA ACRES: 1: 110.00 2: 3: 4:
 STAND STRUCTURE: 1: 520 2:3: 4:
 STAND AVERAGE SITE FOR DF: 73 i: 73 2: 3: 4:
 STAND AVERAGE SITE FOR PP: 73 1: 73 2: 3: 4:

BASAL AREA FACTOR: B1: 20.00 B2: B3: B4:
 FIXED AREA PLOT SIZE: F1: 0.004 F2: 0.025 F3: 0.010 F4: 0.010

FIXED PLOT RADIUS: R1: 7.80 R2: 15.56 R3: 11.70 R4: 11.70

		----- D B H -----								
		TOTALS	00-06	07-10	11-14	15-18	19-22	23-26	27-30	31-34 35+
DOUG FIR										
AVE HGT	49	22	60	66	94	92	97	110	13	139
TREES/AC	181.7	78.0	54.9	24.6	11.5	8.4	2.4	0.5	0.4	1.1
BA/ACRE	106	6	23	20	16	18	8	2	2	12
LOGS/AC	311	4	123	78	48	37	12	2	0	7
INCENSE										
AVE HGT	19	6			83	91	80	98		
TREES/AC	29.7	25.0			1.5	1.7	1.1	0.4		
BA/ACRE	12	0			2	4	4	2		
LOGS/AC	17				5	7	4	2		
POND PINE										
AVE HGT	67	40	59	70	84	92	128	102	120	
TREES/AC	95.0	16.0	39.5	7.7	17.5	10.6	1.1	1.3	1.4	
BA/ACRE	94	3	17	6	26	24	4	6	8	
LOGS/AC	565	24	186	52	151	103	16	15	18	

SUGAR PINE

AVE HGT	89	72	90	103	104	129
TREES/AC	8.9	4.1	1.6	1.4	0.9	0.8
BA/ACRE	24	6	4	4	4	6
LOGS/AC	44	15	9	8	6	6

WHITE FIR

AVE HGT	9	6	78
TREES/AC	26	25.0	1.0
BA/ACRE	2	0	2
LOGS/AC			8

STAND SUMMARY

	TOTALS	D B H-----								
		00-06	07-10	11-14	15-18	19-22	23-26	27-30	31-34	35+
AVE HGT	50	19	60	67	85	91	101	103	96	135
TREES/AC	31	144	94.4	32.3	34.6	23.4	6	3.1	1.8	1.9
BA/ACRE	238	8	40	26	50	52	20	14	10	18
LOGS/AC	946	28	309	130	219	165	39	25	18	13

T08 - STAND TABLE BY SPECIES & DBH GROUP - Mixed Conifer

MEDFORD DISTRICT -INVENTORY Plots 10 SCR:W PAGE: 1
 PROJECT NAME: LSRJENNY Trees 115 CUB:S RUN DATE: 11/22/99
 TWP 40S RGE 04E SEC 21 UNIT 0977P ACRES: 102.00 EXAM DATE: 8/17/98
 RMA: 525 AVERAGE UNIT CROWN CLOSURE: 77%
 OI KEY NUMBERS: 123671 123672 124101 121702
 STAND MODEL TYPE: ORGANON - HANN-SCRIVANI SPECIES TABLE :51 ASHLAND
 STRATA ACRES: 1: 102.00 2: 3: 4:
 STAND STRUCTURE: 1: 501 2: 3: 4:
 STAND AVERAGE SITE FOR DF: 64 i: 64 2: 3: 4:
 STAND AVERAGE SITE FOR PP: 35 1: 35 2: 3: 4:
 BASAL AREA FACTOR: B1: 20.00 B2: B3: B4:
 FIXED AREA PLOT SIZE: F1: 0.004 F2: 0.025 F3: 0.010 F4: 0.010
 FIXED PLOT RADIUS: R1: 7.80 R2: 15.56 R3: 11.70 R4: 11.70

	TOTALS	D B H-----								
		00-06	07-10	11-14	15-18	19-22	23-26	27-30	31-34	35+
DOUG FIR										
AVE HGT	42	17	64	68	84	92	104	63	118	143
TREES/AC	296.6	166	47.6	41.6	25.2	11.6	2.5	.9	.4	.9
BA/ACRE	150	8	20	36	36	26	8	4	2	10
LOGS/AC	404	8	99	126	96	51	12	3	2	6

INCENSE

AVE HGT	47	23	35	53	81	95	100	94
TREES/AC	21.2	8	4.5	2.7	4.1	.6	.5	.8
BA/ACRE	29	1	2	4	10	2	2	8
LOGS/AC	35		5	7	15	2	2	4

POND PINE

AVE HGT	44	21		84	70	106	123	142	125
TREES/AC	36	25		2.9	3.6	.6	1.3	.3	2.3
BA/ACRE	44	2		4	8	2	6	2	20
LOGS/AC	115			25	27	7	17	5	32

SUGAR PINE

AVE HGT	38	10		60	45
TREES/AC	10	4		4.4	1.6
BA/ACRE	6	0		4	2
LOGS/AC	20			15	5

WHITE FIR

AVE HGT	16	10		30	74
TREES/AC	38.5	29		8.7	.8
BA/ACRE	7	1		4	2
LOGS/AC	34			28	6

CALIF BL

AVE HGT	28	22		43	71
TREES/AC	57.1	45		8.4	3.7
BA/ACRE	11	4		3	4
LOGS/AC	68	8		34	26

STAND SUMMARY

		----- D B H -----								
	TOTALS	00-06	07-10	11-14	15-18	19-22	23-26	27-30	31-34	35+
AVE HGT	38	17	55	68	79	85	103	99	129	123
TREES/AC	459.4	277	69.3	49.6	32.4	20.1	3.7	2.6	.7	4
BA/ACRE	247	16	29	44	46	46	12	12	4	38
LOGS/AC	675	16	165	168	133	99	22	22	7	42

08 - STAND TABLE BY SPECIES & DBH GROUP - White Fir

MEDFORD DISTRICT -INVENTORY Plots 10 SCR:W PAGE: 1

PROJECT NAME: LSRJENNY Trees 115 CUB:S RUN DATE: 11/22/99

TWP 39S RGE 03E SEC 25 UNIT 2078P ACRES: 100.00 EXAM DATE: 7/8/98

RMA: 525

AVERAGE UNIT CROWN CLOSURE: 64%

OI KEY NUMBERS: 123087

STAND MODEL TYPE: ORGANON - HANN-SCRIVANI SPECIES TABLE :51 ASHLAND

STRATA ACRES: 1: 100.00 2: 3: 4:

STAND STRUCTURE: 1: 501 2: 3: 4:
 STAND AVERAGE SITE FOR DF: 76 i: 76 2: 3: 4:
 BASAL AREA FACTOR: B1: 20.00 B2: B3: B4:
 FIXED AREA PLOT SIZE: F1: 0.004 F2: 0.025 F3: 0.010 F4: 0.010
 FIXED PLOT RADIUS: R1: 7.80 R2: 15.56 R3: 11.70 R4: 11.70

		----- D B H -----								
	<u>TOTALS</u>	<u>00-06</u>	<u>07-10</u>	<u>11-14</u>	<u>15-18</u>	<u>19-22</u>	<u>23-26</u>	<u>27-30</u>	<u>31-34</u>	<u>35+</u>
DOUG FIR										
AVE HGT	44	22		79	78	114	95		145	137
TREES/AC	47.9	33		7.7	2.9	.8	.6		.3	2.5
BA/ACRE	52	4		6	4	2	2		2	32
LOGS/AC	70	8		25	10	4	3		2	17
INCENSE										
AVE HGT	47		30	59				92	66	78
TREES/AC	14.9		8.1	4.1				1.4	1.1	.3
BA/ACRE	23		3	4				6	6	4
LOGS/AC	29		8	10				6	3	1
POND PINE										
AVE HGT	118							120		114
TREES/AC	.7							.4		.3
BA/ACRE	4							2		2
LOGS/AC	9							5		3
SUGAR PINE										
AVE HGT	109				71		112	123	121	137
TREES/AC	5				1.7		.7	.4	.7	1.6
BA/ACRE	30				2		2	2	4	20
LOGS/AC	32				7		4	3	5	14
WHITE FIR										
AVE HGT	42	23	40	73	78	88	82	106	107	106
TREES/AC	229.9	132	32.7	21	17.5	9.2	7.3	3.6	2	4.4
A/ACRE	181	12	13	18	26	22	24	16	12	38
LOGS/AC	704	24	115	149	143	88	65	43	24	54
STAND SUMMARY										
AVE HGT44	23	38	73	78	90	86	105	102	120	
TREES/AC	298.4	165	40.8	32.9	22	10.1	8.6	5.8	4.1	9.2
BA/ACRE	289	16	6	28	32	24	28	26	24	96
LOGS/AC	844	32	23	184	160	92	72	57	34	89

Appendix H

Snag Decay Class and Size Class Distribution

Snags are key structural components of LSOG forest habitat. The NFP/ROD recognizes the importance of snags in several places, as evidenced by this passage from the lengthy section on salvage in the LSRs:

Tree mortality is a natural process in a forest ecosystem. Diseased and damaged trees are key structural components of LSOG forests. Accordingly, management planning for LSRs must acknowledge the considerable value of retaining dead and dying trees in the forest, as well as the benefits from salvage activities.
(NFP/ROD C-13)

The authors of the NFP/ROD were concerned enough about snags and their importance in forested ecosystems that the Scientific Analysis Team recommended that no snags over 20 inches be marked for cutting, even in the Matrix. (ROD C-46). However, this recommendation was not officially adopted as a standard and guideline.

The following tables display the decay class distribution of snags observed within each ecoregion.

Siskiyou Foothills Ecoregion

Table H-1. Decay class distribution of snags (all sizes) within Siskiyou Foothills Ecoregion

Decay Class	# Snags Observed	Percent of Observed
1	17	14.
2	22	19.1
3	16	13.9
4	15	47.8
5	5	4.4
TOTAL	75	100

Table H-2. Decay class distribution of snags (>15.9" dbh) within Siskiyou Foothills Ecoregion

Decay Class	# Snags Observed	Percent of Observed
1	5	21.7
2	2	8.7
3	6	26.1
4	6	26.1
5	4	17.4
TOTAL	23	100

Table H-3. Snag species distribution (all sizes) in the Siskiyou Foothills Ecoregion

Species	# Snags Observed	Percent of Observed
Sugar Pine	0	0
Ponderosa Pine	3	4.0
White Fir	20	26.7
Douglas Fir	32	42.7
Pacific Madrone	7	9.3
I. Cedar	4	5.3
Chinquapin	0	0
Black Oak	9	12.0
TOTAL	75	100

Table H-4. Snag species distribution (>15.9" dbh) in the Siskiyou Foothills Ecoregion

Species	# Snags Observed	Percent of Observed
Sugar Pine	0	0
Ponderosa Pine	3	13.0
White Fir	6	26.1
Douglas Fir	12	52.1
Pacific Madrone	0	0
I. Cedar	1	4.3
Chinquapin	0	0
Black Oak	1	4.4
TOTAL	23	100

Klamath River Ridges Ecoregion**Table H-5. Decay class distribution of all snags (all sizes) within Klamath River Ridges Ecoregion**

Decay Class	# Snags Observed	Percent of Observed
1	73	45.6
2	34	21.3
3	18	11.2
4	24	15.0
5	11	6.9
TOTAL	160	100

Table H-6. Decay class distribution of snags (>15.9" dbh) within Klamath River Ridges Ecoregion

Decay Class	# Snags Observed	Percent of Observed
1	30	38.0
2	18	22.8
3	9	11.4
4	12	15.2
5	10	12.7
TOTAL	79	100

Table H-7. Snag species distribution (all snags) in the Klamath River Ridges Ecoregion

Species	# Snags Observed	Percent of Observed
Sugar Pine	5	3.1
Ponderosa Pine	5	3.1
White Fir	108	68.0
Douglas Fir	20	12.5
Pacific Madrone	0	0
I. Cedar	15	9.4
Chinquapin	6	3.8
Black Oak	1	0.6
TOTAL	160	100

Table H-8. Snag species distribution (>15.9" dbh) in the Klamath River Ridges Ecoregion

Species	# Snags Observed	Percent of Observed
Sugar Pine	4	5.1
Ponderosa Pine	3	3.8
White Fir	49	62.0
Douglas Fir	15	19.0
Pacific Madrone	0	0
I. Cedar	8	10.1
Chinquapin	0	0
Black Oak	0	0
TOTAL	79	100

South Cascades Ecoregion**Table H-9. Decay class distribution of snags (all snags) within South Cascades Ecoregion**

Decay Class	# Snags Observed	Percent of Observed
1	69	41.6
2	59	35.5
3	14	8.4
4	18	10.8
5	6	3.6
TOTAL	166	100

Table H-10. Decay class distribution of snags (>15.9" dbh) within South Cascades Ecoregion

Decay Class	# Snags Observed	Percent of Observed
1	31	38.8
2	22	27.5
3	7	8.7
4	15	18.8
5	5	6.3
TOTAL	80	100

Table H-11. Snag species distribution (all sizes) in the South Cascades Ecoregion

Species	# Snags Observed	Percent of Observed
Sugar Pine	3	1.8
Ponderosa Pine	11	6.6
White Fir	119	71.7
Douglas Fir	25	15.1
Pacific Madrone	0	0
I. Cedar	8	4.8
Chinquapin	0	0
Black Oak	0	0
TOTAL	166	100

Table H-12. Snag species distribution (>15.9" dbh) in the South Cascades Ecoregion

Species	# Snags Observed	Percent of Observed
Sugar Pine	3	3.8
Ponderosa Pine	10	12.5
White Fir	46	57.5
Douglas Fir	14	17.5
Pacific Madrone	0	0
I. Cedar	7	8.8
Chinquapin	0	0
Black Oak	0	0
TOTAL	80	100

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**UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT**

**Oregon State Office
P.O. Box 2965
Portland, Oregon 97208**

In Reply Refer to:
5400 (OR-931)

November 19, 1996

EMS TRANSMISSION 11/20/96
Information Bulletin No. OR-97-064

To: District Managers: Coos Bay, Eugene, Lakeview, Medford, Roseburg, and Salem

From: State Director

Subject: Implementation of Coarse Woody Debris Standards and Guidelines

Instruction Memorandum No. OR-95-028 dated November 29, 1994, provided guidance for the implementation within Matrix management lands of coarse woody debris (CWD) Standards and Guidelines (S&Gs) (pp. C-40 and 41 of the Northwest Forest Plan). As we continue to gain experience working with CWD on the ground, various prescriptions have been developed and clarifications requested for their use.

This Information Bulletin discusses options and clarification for the following CWD features:

- Retention of existing CWD;
- Crediting linear feet of logs;
- Crediting of large diameter short piece (less than 16/20 feet) logs by using a cubic foot equivalency alternative;
- Standing tree CWD retention versus felling to provide CWD substrate;
- Application of the basic guideline in areas of partial harvest.

The information contained in this bulletin may be used for the design and layout of Matrix harvest sales; however, proposed timber sales where layout has been completed need not be modified. Resource Management Plans may limit the implementation of some of these recommendations. This Information Bulletin has been shared widely with other agency specialists and a copy has been provided to the Regional Ecosystem Office (REO). We are forwarding the attached discussion paper for information and detail on how various resource areas have dealt with CWD issues.

The development of models for groups of plant associations and stand types to be used as a baseline for prescriptions within specific geographic areas is encouraged (S&Gs at C-40, Part A, and C-41, Part E). The desired conditions should address both sustainable ecological and biological conditions, even providing habitat beyond natural conditions. Some working "CWD" and "desirable condition"

definitions are given in the Appendix: historical ecological condition, species-specific biological condition, and desired future condition. Taking advantage of opportunities "to provide coarse woody debris well-distributed across the landscape in a manner which meets the needs of species and provides for ecological functions" should be captured in your local prescriptions.

If you have any additional questions, please contact Larry Larsen at 503-952-6080 or Nancy Anderson at 503-952-6072.

Signed by
A. Barron Bail
Acting Deputy State Director for
Resource Planning, Use & Protection

Authenticated by
Maggie Weaver
Management Asst.

1 Attachment

- 1 - Questions & discussion re S&Gs
for coarse woody debris (8 pp)

Distribution

WO-330 (Room 204 LS) - 1
OR-930 - 1
REO (Knowles, Pietrzak) - 2

**Questions and Discussion Regarding Standards and Guidelines to
Provide specified amounts of coarse woody debris in matrix management.**

This paper discusses the implementation of the Standard and Guideline (S&G) titled "*Provide specified amounts of coarse woody debris [CWD] in matrix management*" (S&G C-40 and C-41). The S&G prescribed specific measures (S&G C-40, Part B) which need to be used until geographic guidelines are developed (S&G C-40, Parts A and E). As local knowledge on how best to design timber sales continues to increase, the ways to achieve adequate quantities of CWD are also developing. We have drafted a question-and-answer discussion paper which we believe will be helpful in your implementation of this S&G.

1. **QUESTION:** Retention and protection of CWD already on the ground was not addressed in Instruction Memorandum No. OR-95-028. Standard and Guideline C-40, Part C, states: "Coarse woody debris already on the ground should be retained and protected to the greatest extent possible from disturbance during treatment which might destroy the integrity of the substrate." Is the priority "to provide" CWD or "to retain" existing CWD? Is it appropriate to remove decay classes 1 and 2 and replace them? How limiting is "protect to the greatest extent possible?" Is the presence or absence of bark, post-logging, the critical indicator of functioning decay class 1 or 2 logs?

DISCUSSION: Logs present on the forest floor prior to harvest generally are providing habitat benefits that will likely continue after harvest. Where practicable, pre-harvest CWD decay class 1 and 2 logs should be reserved (e.g., painted with the reserve color) in adequate quantities to provide the baseline feet requirement; other decay class logs are to be protected to the extent possible. Specified amounts of decay class 1 and 2 logs to be retained is given in C-40, Part B; and suggested locations of retention areas is given in C-41, Part D.

The phrase "protected to the greatest extent possible" recognizes felling, yarding, slash treatments, and forest canopy openings will disturb CWD substrate and their dependent organisms. These disturbances should not cause substrates to be removed from the logging area nor should they curtail treatments. Appropriate protective practices should be addressed during logging design such as locating forest patches to retain logs, use of site preparation techniques, and attention to CWD during contract administration to minimize damage and protect substrate integrity. As a general rule, a reserve clause would be used in the timber sale contract and site preparation activities would be designed to minimize disturbance for all decay classes. During contract administration, our desire to protect these logs to the greatest extent possible should be conveyed to the purchaser.

Following harvest, coarse woody debris should be retained both for the current forest habitat and for the development and function of the next forest. Prescriptions should account for current habitat conditions and the timing and development of subsequent snags and CWD until the next stand once again begins to contribute CWD. Decay substrates as a group generally persist for hundreds of years. Some CWD last up to 500 years within some forest ecosystems, while in others the life span is as short as 60 years. Advanced decayed material often holds large amounts of water and nutrients and contains the majority of soil horizon ectomycorrhizae.

Prescriptions are to provide CWD to a full array of late-successional related species and to ensure soil organic material replacement over the next 100 years.

Prior to removal of any decay class 1 or 2 logs, the Interdisciplinary Team should evaluate the "appropriate coarse woody debris quantity, quality (such as species, decay stage and size) and distribution." Down logs should reflect the species composition of the original stand in order to retain the habitat conditions which would have occurred without harvest. The removal of excess decay class 1 and 2 logs is contingent upon the evidence of appropriately retained or provided amounts of decay class 1 and 2 logs. Large amounts of CWD are naturally and periodically infused into the forest following fires, blowdown, and snow/rain events and provide benefits to late-successional species. "Salvage" of these materials must provide for adequate levels of desirable biological substrates.

The presence or absence of bark has been used as a method to help logging crews distinguish between decay class 2 and 3 logs. Experience has indicated that some surface bark will be dislodged from CWD during felling, yarding, and site preparation. The presence or absence of bark is an important indicator, but not the sole critical indicator. (See structural features associated with decay class logs as given in the Forest Survey Handbook H-5250-1, "A five-class system of log decomposition based on fallen Douglas-fir trees," pp. IV-13/-16. In discussing site preparation, Graham et al. (1994) concluded that fire which charred bark and wood did not interfere substantially with the decomposition or function of CWD.) (Graham, et al., Managing Coarse Woody Debris in Forests of the Rocky Mountains. USDA Res Paper INT-RP-477. 1994.)

Cedar logs, whose wood texture remains decay class 2 for extended periods, tend to accumulate over time. They also tend to lose their bark when, as substrate, they still exhibit decay class 1 or 2 habitat features of structure and texture (i.e., buckskin logs); and their function is that of a decay class 1 or 2 log although bark retention is analogous to that of decay class 3 logs. Post-logging retention, or the removal, of some of these barkless logs is not expected to be critical to the overall function of CWD within a sale unit.

2. **QUESTION:** Specific amounts of decay class 1 and 2 logs are required following regeneration harvest (S&G C-40, Part B); and in crediting linear feet per acre, Instruction Memorandum No. OR-95-028 stated minimum diameter logs may be measured at the large end. For minimum diameter logs, what length can be credited as a piece to meet the linear feet CWD requirement?

DISCUSSION: In the case of minimum diameter-sized logs (16 or 20 inches at the large end), one minimum piece length (16 or 20-foot section) beyond the minimum diameter may be credited. Bucking tree lengths into sections is not the intent of this clarification or the S&G; long log lengths are preferable.

3. **QUESTION:** Large diameter, short piece length decay class 1 and 2 logs are being removed from units; and small diameter, adequate length logs are being retained. Can a volume equivalent to 20 inches x 20 feet, (i.e., logs greater than 40 cubic feet) be used to retain large diameter piece logs by crediting their footage toward meeting the linear feet of logs per acre requirement? (See Table 1)

DISCUSSION: An appropriate quantity and quality of CWD must be provided, and the specific measure states "Logs less than 20 [or 16] feet cannot be credited toward this [required minimum] total" (S&G C-40, Part B). Lacking those logs, the general rule is to retain the best material available.

We believe the specific measures are a baseline. We can use the specific measure to develop prescriptions for the retention of CWD. Larger CWD is important for the development and function of both the current and next forest; and because large diameter pieces of CWD have more durable heartwood than small pieces, they last longer. Large logs are a key habitat component for many forms of wildlife; and by disrupting air flow and providing shade, they insulate and protect various forest species.

In many cases, large diameter logs which are the result of felling breakage during logging are removed, and then much smaller diameter logs are left on the unit to meet CWD requirements. Large diameter log sections often possess desirable CWD characteristics such as having more heartwood than smaller pieces. Yet, under the S&Gs, these pieces would not "count" because they are less than 16/20 feet long. Based on field examination, some biologists recommend the retention of these large diameter, shorter length logs. If these segments provide the desired CWD form and function despite the fact that their length is shorter than the specified minimum, they may be counted towards the linear requirement when:

- the large end diameters are greater than 30 inches and log length is greater than 10 feet;
- log diameters are in excess of 20 inches and volume is in excess of 40 cubic feet; (see attached table)
- they are the largest material available for that site.

4. **QUESTION:** When adequate amounts of pre-logging CWD are lacking, is it okay to provide standing green trees versus immediately felling trees during the regeneration harvest to meet the decay class 1 and 2 log specific measures, at least in the short term?

DISCUSSION: The standard is "[m]anage to provide a renewable supply of large down logs well distributed across the matrix landscape in a manner that meets the needs of species and provides for ecological functions." It is also recognized that "scattered green trees will provide a future supply of down woody material" The specific measures are to provide a supply of decay class 1 and 2 logs at the time of regeneration (and partial) harvest.

It is essential that at the time of regeneration harvest (and partial harvest) provisions be in place to ensure the supply of adequate amounts of CWD. In most cases, the required CWD amounts should be either reserved existing CWD or retained felled logs. (The original memorandum contained a special provision to be used for sales where the purchaser would "select" CWD to be left.) The strategy for CWD should be clearly documented during the planning process.

Experience suggests when tree sizes, disturbance history, and regeneration-harvest stand scheduling does not provide adequate down woody debris, the deficiency, including total

absence, of decay class 1 and 2 logs could be corrected by marking additional standing trees and leaving them standing for a period following harvest. This could be accomplished by augmenting the Bureau of Land Management's scattered green tree retention (C-41) requirements. The additional trees would initially be left standing.

If the S&Gs require that 6-8 green trees per acre be retained, prescriptions would require that additional green trees be marked for retention and protection during sale preparation. Adequate potential trees would be retained whether these trees are to be felled or left as green trees for future down woody debris. By reserving all or a portion of decay class 1 and 2 logs, and additional standing trees as described above to correct any deficit, new contract language would not be needed. Operationally, some reserved green trees will be knocked down or felled during the course of logging operations.

Four scenarios have been proposed and recommended to provide the decay class 1 and 2 material by utilizing standing CWD trees:

Scenario 1. Blowdown commonly occurs and wind normally fells retention trees, providing both snags and down CWD immediately following regeneration harvest. After two winter seasons, wind-firm trees may still be standing; top snap occurs providing both snags and CWD; and blowdowns include total tree length, often with the root wad attached. A third year assessment would monitor for CWD and determine if the need exists to fell trees to meet the required linear feet.

Scenario 2. In small diameter regeneration harvest stands, the largest sized green trees are selected as CWD trees and felled following harvest. The alternative is to allow these trees to remain standing and potentially to grow into larger sized diameter CWD substrate after a reasonable period of time. The treatment is similar to partial harvest or commercially thinned units (see Question 5). To date, green tree CWD retention prescriptions have included some or all of the following elements:

- retain the largest sized diameter trees for required green leave trees;
- immediately post-harvest, ensure that enough logs are on the ground to meet one-half the CWD requirement;
- designate additional standing green trees to grow larger diameter trees;
- CWD green trees would be left standing for a period of time, 5-15 years, until they attained the desired larger size or succumbed to natural mortality. The necessary window to grow and provide the specified amount of CWD could be as long as 30 years.

Scenario 3. The strategy is to meet the decay class 1 and 2 log level required post-harvest immediately following logging or the site preparation treatment period. This strategy assumes that an adequate number of reserve trees are retained to meet the requirement. Upon completion of harvest, the existing linear feet of decay class 1 and 2 logs for each sale unit are tallied; and then the reserve trees are felled to meet the 120/240 linear foot requirement. Knockdowns, trees felled to alleviate a logging

concern, and blowdowns are counted toward the total linear feet so long as they meet the decay class, diameter, and length requirements. The minimum amount of CWD linear feet are ensured, and excess trees continue to grow.

Scenario 4. Provide the full requirement of CWD logs in reserve trees. There is no need to measure linear feet since the decay class 1 and 2 requirements will be met from the standing, reserved trees. Accept whatever linear feet of decay class 1 and 2 logs is present on the unit post-harvest. It may range from zero to several hundred linear feet. The management action will be to allow natural forces (primarily, windthrow) to provide infusions of trees into CWD decay classes 1 and 2 over time from the population of marked retention trees and snag replacement trees. The option remains to revisit the site over time to monitor decay class 1 and 2 conditions and consider whether elective felling of selected retention trees is warranted. Note that any trees marked as replacement trees to correct snag deficiencies in the short term (three decades) may not count toward the standing retention tree requirements and may not be felled to account for the decay class 1 and 2 logs.

5. QUESTION: "In areas of partial harvest the same basic guidelines are to be applied, but they should be modified to reflect the timing [of] stand development cycles where partial harvesting is practiced" (S&G C-40, Part B). Does this mean we should be felling trees to provide CWD in selection and commercial thinning areas?

DISCUSSION: An accumulation of CWD should be designed into partial harvest prescriptions to provide a natural or biologically desired condition. The timing of stand development cycles providing snags and subsequent CWD from natural suppression and overstocking mortality should be accounted for, the desired conditions estimated, and then the advantages of treatment to improve habitat conditions beyond natural conditions should be assessed. The amounts of CWD should be specifically provided, including felling trees, to meet the desired conditions for late-successional forest related species. CWD trees are not normally required to be felled during harvest, especially trees with broken tops, advanced decay, or other deformities contributing habitat structural features. Leaving naturally dense clumps around snags to provide suppression mortality, scattering "structural" green trees, and allowing individual trees to grow into larger sized CWD materials should be considered in partial harvest plans. Leaving green trees and felling to provide a source for CWD should be part of the partial harvest prescription. The intent is to provide a source of "coarse woody debris well distributed across the landscape in a manner which meets the needs of species and provides for ecological functions."

Appendix Working Definitions

Coarse Woody Debris (CWD):

The portion of a tree that has fallen or been cut and left in the woods. Usually refers to pieces at least 20 inches in diameter (ROD Glossary F-4).

Coarse Woody Debris (CWD) or Down Woody Debris (DWD):

Any large piece of woody material having a diameter greater than 10 cm (4 inches) and a length greater than 1.0 meter (39 inches)¹. Fifteen to twenty percent ground cover of DWD or 4.5-10 tons of fresh DWD would be adequate after timber harvesting for optimal amounts of small mammal habitat and organic matter².

Desired Condition (DC):

Structural characteristics of late-successional forest vary with vegetation type, disturbance regime, and developmental stage. The desired condition also varies whether the target is a "natural" desired condition or a "biological" desired condition.

Historic Ecological Conditions (HEC):

This term is used to describe a set of ecological conditions that were likely present prior to European influence on the landscape. One of the assumptions was that during this time period natural processes and functions were occurring under inherent disturbance regimes, and thus these represent sustainable conditions. A description of these conditions is usually synonymous with the natural or historic range of variability and focuses on maintaining ecosystem processes and functions, not necessarily the viability of a particular species.

Species-Specific Biological Conditions (SBC):

This term is used to describe a set of biological conditions specific to the viability of a particular species. In particular, this term was used to describe habitat conditions for the northern spotted owl or other late-successional/old-growth forest-related species that may address short-term (up to 50 years) viability concerns. These habitat conditions are not necessarily the DEC and may not be sustainable in the long term (greater than 50 years) due to a variety of potential disturbances.

Desired Future Conditions (DFC):

This term is used to describe the interaction between HEC, SBC, and any other social issues that may result in deviation from the HEC. For example, the HEC is described for a particular vegetation type and due to the viability concern for northern spotted owl or other late-

¹Society of American Foresters. Forest Ecology Working Group Terms. 1996.

²Carey, A. and M. Johnson: Small Mammals in Managed, Naturally Young and Old-Growth Forests. Ecological Application 5(2): 336-351, 1995; Nakamura, F. And F. Swanson: Distribution of Coarse Woody Debris in a Mountain Stream, Western Cascades Range, Oregon. Canadian Journal of Forestry Research 24: 2395-2403, 1994.

successional/old-growth forest-related species, the SBC requires a deviation from the HEC. By overlaying the two conditions, the DFC for that vegetation type is then described. In cases where there were no overriding viability issues with any species, the HEC was synonymous with the DFC.

TABLE 1
VOLUME PER LOG SEGMENT
TAPER PER 16 FEET

Diameter Large End (inches)	Segment Length (feet)									
	20	18	16	14	12	10	8	6	4	
20	38.5	35.1	31.6	28.0	24.3	20.5	16.6	12.6	8.5	
22	47.1	42.9	38.6	34.1	29.6	24.9	20.2	15.3	10.3	
24	56.6	51.5	46.3	40.9	35.4	29.8	24.1	18.3	12.3	
26	67.0	60.9	54.6	48.3	41.8	35.1	28.4	21.5	14.5	
28	78.2	71.0	63.7	56.2	48.6	40.9	33.0	25.0	16.8	
30	90.3	82.0	73.5	64.8	56.0	47.1	38.0	28.7	19.3	
32	103.3	93.7	84.0	74.0	64.0	53.7	43.3	32.7	22.0	
34	117.2	106.2	95.1	83.8	72.4	60.8	49.0	37.0	24.9	
36	131.9	119.5	107.0	94.3	81.4	68.3	55.0	41.5	27.9	
38	147.5	133.6	119.6	105.3	90.9	76.2	61.4	46.3	31.1	
40	164.0	148.5	132.8	116.9	100.9	84.6	68.1	51.4	34.5	
42	181.3	164.2	146.8	129.2	111.4	93.4	75.2	56.7	38.0	
44	199.5	180.6	161.4	142.1	122.5	102.6	82.6	62.3	41.8	
46	218.6	197.8	176.8	155.5	134.0	112.3	90.3	68.1	45.7	
48	238.6	215.8	192.9	169.6	146.2	122.4	98.5	74.2	49.7	
50	259.4	234.6	209.6	184.3	158.8	133.0	106.9	80.6	54.0	
52	281.1	254.2	227.1	199.6	171.9	144.0	115.7	87.2	58.4	
54	303.7	274.6	245.2	215.6	185.6	155.4	124.9	94.1	63.0	
56	327.2	295.8	264.1	232.1	199.8	167.3	134.4	101.3	67.8	
58	351.5	317.7	283.6	249.2	214.6	179.6	144.3	108.7	72.8	
60	376.7	340.4	303.9	267.0	229.8	192.3	154.5	116.3	77.9	

Appendix I

Fire Management Plan

The main objective of this plan is to provide guidelines to managers for fuels management activities and fire suppression efforts in the LSR. The application of fuels management activities, combined with the use of prescribed fire, are considered appropriate management tools. In some cases, however, fire suppression will remain an essential management activity to protect resources and values at risk.

Fuels Management

Utilizing prescribed fire and other fuels reduction methods can reduce areas which have mixed to high lethal fire effects. Over the long term, this would insure the protection and enhancement of "old growth" characteristics which is the goal of the LSR. The main objective of fuel reduction treatments are to minimize damage to existing late-successional habitat (McKelvie Habitat Types 1 and 2) from wildfires which may occur. The prioritization of areas to treat existing fuels would be based on the fire behavior potential modeled by the FARSITE program and the Fire Hazard Rating. The order in which areas would be selected for treatment are:

- 1) Stands that are:
 - a) within 1/4 mile of McKelvie 1 and 2 habitat **and**
 - b) where predicted flame lengths are greater than 8' in length.
- 2) Stands that are:
 - a) within 1/4 mile of McKelvie 1 and 2 habitat **and**
 - b) where predicted flame lengths are 4-8' in length.
- 3) McKelvie 1 and 2 habitat where flame lengths are greater than 8' in length.
- 4) McKelvie 1 and 2 habitat where flame lengths are 4'-8' in lengths.
- 5) Areas which have been classified as high fire hazard.
- 6) Stands that are:
 - a) within 1/4 mile of McKelvie 1 and 2 habitat **and**
 - b) where fire hazard is classified as moderate.

Fire Suppression

The Oregon Department of Forestry has the responsibility of fire protection of all lands within the Jenny Creek LSR. Their primary objective is to minimize total acres burned while providing for fire fighter safety. Due to the mixed ownership pattern and political constraints, the use of wildfire to meet resource objectives such as reducing fuel loadings over a large area is very

limited and not possible most of the time. Wildfire suppression efforts on BLM lands within the LSR will generally be driven by the objective to maintain late-successional habitat. A Wildfire Fire Situation Analysis will be completed and reviewed by the appropriate line officer for all wildland fires that exceed the capabilities of initial attack resources.

Methods that encourage minimal impacts will be considered to assure that damage to habitat is minimized. Resource advisors from the BLM will be utilized to ensure that suppression forces are aware of all sensitive areas. Maps identifying sensitive areas, as well as those areas where certain suppression activities are not limited, are made available to suppression forces before the start of each fire season. Areas of special concern for fire management within the LSR are listed in the following table.

Table I-1. Fire management areas of special concern

Designation	Location	Fire Suppression Tactics
Owl Core Areas	Various	<ul style="list-style-type: none"> Protect nest tree and adjacent trees from felling or any type of damage. Minimize fire damage to NSO activity centers.
Jenny Creek ACEC	T40S, R4E, Sections 4,5,8,9,17 T39S, R4E Section 27	<ul style="list-style-type: none"> Confine use of vehicles to existing roads. No use of retardant adjacent to Jenny Creek. Do not use Jenny Creek as a water source for fire suppression efforts. No use of tractors. Dispatch project manager and environmental specialist immediately.
Oregon Gulch RNA	T40S, R4E Sections 19,20,29,32	<ul style="list-style-type: none"> Confine use of vehicles to existing roads. No use of tractors. Dispatch project manager and environmental specialist immediately.
Chinquapin Progeny Site	T39S, R3E Section 34	<ul style="list-style-type: none"> No tractor use inside of fence. Do not cut any conifers inside of fence area. Reduce the number of trees lost. No use or retardant. Dispatch project manager and environmental specialist immediately.
Burton Progeny Test Site	T40S, R4E Section 17	
Hyatt Lake Recreation Site	T39S, R3E Section 22	<ul style="list-style-type: none"> Minimize disturbance to recreation site. Dispatch project manager and environmental specialist immediately.
Beene Cabin	T40S, R3E Section 21	<ul style="list-style-type: none"> Minimize disturbance to recreation site Dispatch project manager and environmental specialist immediately.

Designation	Location	Fire Suppression Tactics
Pacific Crest Trail	T39S, R3E Sections 13,14,15,22 T40S, R3E Sections 9,16,21,28,29,31 T40S, R2E Section 35 T39S, R4E Section 7	<ul style="list-style-type: none"> Minimize impacts due to suppression efforts to trail and the immediate area that is visible from the trail. Allow fire to burn across trail and in surrounding area rather than to put in major tractor lines to suppress fire.
Soda Mountain Wilderness	T41S, R3E Sections 1,2,12 T40S, R2E Section 36 T40S, R3E Sections 31,34,35	<ul style="list-style-type: none"> Logs within the proposed fire line are to be rolled out of their beds; if not possible, construct fire line around the burning log. Helicopters should land in natural landings; helispots should be constructed outside WSA if possible. Water sources should not be improved unless for spot maintenance; if improved, they should be restored to their pre-fire condition. Fire engines, tenders, and other nonearth moving equipment should limit their use to existing roads; cross-country use should be kept to a minimum; crossing of streams, springs, and steeps should be avoided.

During suppression activities on BLM land the following tactics would be used:

- BLM resource advisors will be dispatched to all fires which occur on BLM land within the LSR.

- When feasible, existing roads or trails will be used to burn-out or backfire against to stop fire spread. Backfires will be designed to minimize fire effects on habitat. Natural barriers will be used whenever possible and fires will be allowed to burn to them.

- In the construction of fireline, minimum width and depth will be used to stop the spread of fire. The use of dozers should be minimized and resource advisors will be consulted when appropriate. Live fuels will be cut or limbed only to the extent needed to stop fire spread. Rehabilitation of fire lines will be considered.

- The felling of snags and live trees will only occur when they pose a safety hazard or will cause a fire to spread across the fireline.

- The construction of helispots should be minimized. Past locations or natural openings should be used when possible. Helispots will not be constructed within riparian reserves, or areas of special concern (table 1).
- Retardant or foam will not be dropped on surface waters, riparian reserves, or on occupied spotted owl or eagle nests.
- Resource advisors will determine rehabilitation needs and standards in order to reduce the impacts associated with fire suppression efforts.

Appendix J

Fire/Fuels Modeling

The following is a description of the components and process used in determining fire hazard, fire risk and fire behavior potential for the Jenny Creek LSR.

Fire Risk

Information from the Oregon Department of Forestry database from 1966 to 1995 shows that a total of 102 fires occurred throughout the LSR. Of these fires, 85 were less than 0.25 acres in size (Class A fire). The remaining 29 fires were between 10 and 100 acres in size (Class D fire).

A statistical fire risk analysis was done for the Jenny Creek LSR using the computer program PROBACRE. This program calculates the probability of a large fire event occurring within the LSR utilizing the Poisson distribution. The fire history data from 1966 to 1995 (described above) was used in this program. The annual fire frequency rates for each of the fire sizes used in this program are shown in the following figure:

Figure J-1. Fire occurrence and associated fire frequency used for the PROBACRE analysis.

<u>Size Class</u>	<u>Number of Fires</u>	<u>Annual Fire Frequency</u>
0.25 acres	85	2.93
10 acres	15	0.52
100 acres	2	0.01

The annual fire frequencies were entered and the probability of occurrence for 10, 25, 50, 75, and 100 year periods were calculated. Threshold acres were set at 6,674 acres, 16,684 acres and 33,371 acres (25, 50, and 75 percent of the LSR respectively). Results from PROBACRE program are displayed in the following tables:

Table J-1. Probability of fires in a ten-year period

Fire Size Class	Fire Frequency		Probability of Number of Fires per 10 year Period (percent)					
	Annual	Period	None	One	Two	Three	Four	> Four
0	2.93	29.30	0.0	0.0	0.0	0.0	0.0	100
10	0.52	5.20	0.0	3	7	13	17	59
100	0.07	0.70	50	35	12	3	0.0	0.0
Probability of exceeding 6,674 acre threshold in 10 years is 0.0%								
Probability of exceeding 16,685 acre threshold in 10 years is 0.0%								
Probability of exceeding 33,371 acre threshold in 10 years is 0.0%								

Table J-2. Probability of fires in a 25-year period

Fire Size Class	Fire Frequency		Probability of Number of Fires per 25 year Period (percent)					
	Annual	Period	None	One	Two	Three	Four	> Four
0	2.93	73.25	0.0	0.0	0.0	0.0	0.0	100
10	0.52	13.00	0.0	0.0	0.0	0.0	0.0	100
100	0.07	1.75	17	30	27	16	7	3
Probability of exceeding 6,674 acre threshold in 25 years is 0.0%								
Probability of exceeding 16,685 acre threshold in 25 years is 0.0%								
Probability of exceeding 33,371 acre threshold in 25 years is 0.0%								

Table J-3. Probability of fires in a 50-year period

Fire Size Class	Fire Frequency		Probability of Number of Fires per 50 year Period (percent)					
	Annual	Period	None	One	Two	Three	Four	> Four
0	2.93	146.50	0.0	0.0	0.0	0.0	0.0	100
10	0.52	26.00	0.0	0.0	0.0	0.0	0.0	100
100	0.07	3.50	3	11	18	22	19	27
Probability of exceeding 6,674 acre threshold in 50 years is 0.0%								
Probability of exceeding 16,685 acre threshold in 50 years is 0.0%								
Probability of exceeding 33,371 acre threshold in 50 years is 0.0%								

Table J-4. Probability of fires in a 75-year period

Fire Size Class	Fire Frequency		Probability of Number of Fires per 75 year Period (percent)					
	Annual	Period	None	One	Two	Three	Four	> Four
0	2.93	219.75	0.0	0.0	0.0	0.0	0.0	100
10	.52	39.00	0.0	0.0	0.0	0.0	0.0	100
100	.07	5.25	0.0	3	7	13	17	60
Probability of exceeding 6,674 acre threshold in 75 years is 0.0%								
Probability of exceeding 16,685 acre threshold in 75 years is 0.0%								
Probability of exceeding 33,371 acre threshold in 75 years is 0.0%								

Table J-5. Probability of fires in a 100-year period

Fire Size Class	Fire Frequency		Probability of Number of Fires per 100 year Period (percent)					
	Annual	Period	None	One	Two	Three	Four	> Four
0	2.93	293.00	0.0	0.0	0.0	0.0	0.0	100
10	.52	52.00	0.0	0.0	0.0	0.0	0.0	100
100	.07	7.00	0.0	0.0	2	5	9	83
Probability of exceeding 6,674 acre threshold in 100 years is 0.0%								
Probability of exceeding 16,685 acre threshold in 100 years is 0.0%								
Probability of exceeding 33,371 acre threshold in 100 years is 0.0%								

The fire history data was also used to assess fire risk for the LSR. This assessment of risk utilized the total number of fire starts over a given period of time for the LSR. The value derived corresponds to the likelihood of fire starts per 1,000 acres per decade. The following is the formula that was used to arrive at the fire risk rating:

$$\text{Risk Rating} = \{(x/y)10\}/z$$

x= number of starts recorded for the area from the fire start data base.

y= period of time covered by the data base.

z= number of acres analyzed (displayed in thousands).

Low Risk= 0-0.49; this projects one fire every 20 or more years/thousand acres.

Moderate Risk= 0.5-0.99; this projects one fire every 11-20 years/thousand acres.

High Risk= greater than 0.99; this projects one fire every 0-10 years/thousand acres.

Risk Rating for the LSR= $\{(102/29)10\}31000 = .0011$

Fuel Model Definitions

The prediction of fire behavior is necessary in order to assess the potential damage a fire will have to resources. Predicting fire behavior is possible due to the development of mathematical fire behavior fuel models. Fuels have been classified into four groups: grasses, shrubs, timber, and slash. The differences in these groups are related to the fuel load and distribution of fuel among size classes. Size classes are: 0-1/4" (1 hour fuels), 1/4-1" (10 hour fuels), 1-3" (100 hour fuels), and 3" and greater (1,000 hour fuels). A description of the fire behavior fuel models documented by Albini (1976) is contained in the following table:

Table J-6. Description of fire behavior fuel models

FUEL MODEL Typical Fuel Complex	FUEL LOADING tons/acre				FUEL BED DEPTH in ft.
	1 Hr	10 Hr	100 Hr	Live	
GRASS AND GRASS-DOMINATED					
1-Short Grass (1 ft.)	0.74	0.00	0.00	0.00	1.0
2-Timber (Grass and understory)	2.00	1.00	0.50	0.50	1.0
3-Tall Grass (2 ft.)	3.01	0.00	0.00	0.00	--
CHAPARRAL AND SHRUB FIELDS					
4-Chaparral (6 ft.)	5.01	4.01	2.00	5.01	6.0
5-Brush (2 ft.)	1.00	0.50	0.00	2.00	2.0
6-Dormant Shrub & Hdwd. Slash	1.50	2.50	2.00	0.00	2.5
7-Southern Rough	1.13	1.87	1.50	0.37	2.5
TIMBER LITTER					
8-Closed Timber Litter	1.50	1.00	2.50	0.00	0.2
9-Hardwood Litter	2.92	0.41	0.15	0.00	0.2
10-Timber (Litter and Understory)	3.01	2.00	5.01	2.00	1.0
SLASH					
11-Light Logging Slash	1.50	4.51	5.51	0.00	1.0
12-Medium Logging Slash	4.01	14.03	16.53	0.00	2.3
13-Heavy Logging Slash	7.01	23.04	28.05	0.00	3.0

Thirteen fire behavior predictive fuel models are used during the severe period of fire season when wildfire poses greater control problems and impacts on land resources. The following is a brief description of each of the 13 fire behavior fuel models.

GRASS GROUP

Fire Behavior Fuel Model 1 - Fire spread is governed by the very fine, porous, and continuous herbaceous fuels that have cured or are nearly cured. Fires are surface fires that move rapidly through the cured grass. Very little timber or shrub are present.

Fire Behavior Fuel Model 2 - Fire spread is primarily through cured or nearly cured grass where timber or shrubs cover one to two-thirds of the open area. These are surface fires that may increase in intensity as they hit pockets of other litter.

Fire Behavior Fuel Model 3 - Fires in this grass group display the highest rates of spread and fire intensity under the influence of wind. Approximately one-third or more of the stand is dead or nearly dead.

SHRUB GROUP

Fire Behavior Fuel Model 4 - Fire intensity and fast spreading fires involve the foliage and live and dead fine woody material in the crowns of a nearly continuous secondary over story. Stands of mature shrubs six feet tall or more are typical candidates. Besides flammable foliage, dead woody material in the stands contributes significantly to the fire intensity. A deep litter layer may also hamper suppression efforts.

Fire Behavior Fuel Model 5 - Fire is generally carried by surface fuels that are made up of litter cast by the shrubs and grasses or forbs in the understory. Fires are generally not very intense because the fuels are light and shrubs are young with little dead material. Young green stands with little dead wood would qualify.

Fire Behavior Fuel Model 6 - Fires carry through the shrub layer where the foliage is more flammable than Fuel Model 5, but requires moderate winds greater than eight miles per hour.

Fire Behavior Fuel Model 7 - Fires burn through the surface and shrub strata with equal ease and can occur at higher dead fuel mixtures because of the flammability of live foliage and other live material.

TIMBER GROUP

Fire Behavior Fuel Model 8 - Slow burning ground fuels with low flame lengths are generally the case, although the fire may encounter small "jackpots" of heavier concentrations of fuels that can flare up. Only under severe weather conditions do the fuels pose a threat. Closed canopy stands of short-needled conifers or hardwoods that have leafed out support fire in the compact litter layer. This layer is mostly twigs, needles, and leaves.

Fire Behavior Fuel Model 9 - Fires run through the surface faster than in Fuel Model 8 and have a longer flame length. Both long-needle pine and hardwood stands are typical. Concentrations of dead, down woody material will cause possible torching, spotting, and crowning of trees.

Fire Behavior Fuel Model 10 - Fires burn in the surface and ground fuels with greater intensity than the other timber litter types. A result of over maturing and natural events create a large load of heavy down, dead material on the forest floor. Crowning out, spotting, and torching of individual trees are more likely to occur, leading to potential fire control difficulties.

SLASH GROUP

Fire Behavior Fuel Model 11 - Fires are fairly active in the slash and herbaceous material intermixed with the slash. Fuel loads are light and often shaded. Light partial cuts or thinning operations in conifer or hardwood stands. Clearcut operations generally produce more slash than is typical of this fuel model.

Fire Behavior Fuel Model 12 - Rapidly spreading fires with high intensities capable of generating fire brands can occur. When fire starts, it is generally sustained until a fuel break or change in conditions occur. Fuels generally total less than 35 tons per acre and are well distributed. Heavily thinned conifer stands, clearcuts, and medium to heavy partial cuts are of this model.

Fire Behavior Fuel Model 13 - Fire is generally carried by a continuous layer of slash. Large quantities of material three inches and greater is present. Fires spread quickly through the fine fuels and intensity builds up as the large fuels begin burning. Active flaming is present for a sustained period of time and firebrands may be generated. This contributes to spotting as weather conditions become more severe. Clearcuts are depicted where the slash load is dominated by the greater than three inch fuel size, but may also be represented by a "red slash" type where the needles are still attached because of high intensity of the fuel type.

Fire Hazard

Fire hazard assesses vegetation by type, arrangement, volume, condition and location. These characteristics combine to determine the threat of ignition, spread and difficulty of control of a fire. Hazard ratings for the LSR were developed using fuel models, aspect, elevation, and slope. Hazard ratings were based on the summation of total points assigned based on the following four elements.

1) Fuel Models

Fuel Models 1,2,3,8	0 points
Fuel Models 5,6,9	5 points
Fuel Models 11,10	10 points
Fuel Models 4,12,13	15 points

2) Slope

less than 20%	5 points
20%-45% slope	10 points
greater than 45%	25 points

3) Aspect

315-360 & 0-68 degrees	5 points
68-135 & 293-315 degrees	10 points
135-293 degrees	15 points

4) Elevation

greater than 4,500 feet	10 points
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Table J-7. Hazard rating classes

Points	Hazard Rating
0-24	Low
25-50	Moderate
> 50	High

Potential Wildfire Effects

Stand exam data was collected for the 18 activity centers within the LSR in the summer of 1998. This data was used to develop the following table which displays the number of trees/acre by species and diameter class with exist in McKelvie 1 and 2 habitat.

Table J-8. Number of trees/acre by species and diameter within McKelvie 1 and 2 habitat

Species	10" DBH	14" DBH	18" DBH	22" DBH	26" DBH	30" DBH	34" DBH	35"+ DBH
Douglas-fir	17	14	12	6	4	3	2	2
Incense Cedar	8	6	6	2	1	1	1	2
Ponderosa Pine	0	0	1	1	0	0	0	1
Sugar Pine	0	1	0	1	0	0	0	1
White Fir	40	21	11	7	3	2	1	1
Total stems/Acre	65	42	30	17	8	6	4	7
% of Total Stems/Acre by Diameter Class	36%	23%	17%	10%	5%	3%	2%	4%

The First Order Fire Effects Model (FOFEM) was used to predict mortality, using flame length, to individual tree species within a diameter class. The three general categories for flame length which the FARSITE model predicted were used to determine mortality in the First Order Fire Effects Model. A three foot flame length was used for the category of flame lengths < 4', a seven foot flame length was used for the category of flame lengths 4' - 8' and a ten foot flame length was used for the category of flame lengths >8'. The following tables show the expected mortality by species and diameter class for each of these categories.

Table J-9. Expected mortality within LSOG by species and diameter class with a 3' flame length

Species	10" DBH	14" DBH	18" DBH	22" DBH	26" DBH	30" DBH	34" DBH	35"> DBH
Douglas-fir	25%	14%	8%	5%	4%	3%	2%	2%
Incense Cedar	43%	29%	19%	13%	9%	7%	5%	5%
Ponderosa Pine	NA	NA	11%	7%	NA	NA	NA	3%
Sugar Pine	NA	46%	NA	28%	NA	NA	NA	13%
White Fir	43%	29%	19%	13%	9%	7%	5%	5%
*Mortality of total stems/acre for each DBH class	37%	23%	13%	12%	6%	4%	3%	5%

* The figures in this row reflects the weighted average for all species of total stems killed for each diameter class.

Example:

With a 3' flame length in the 10 inch diameter class the weighted average was 37%. This number was obtained by taking the percent killed by each species (from table 9) and multiplying the total number of stems of each species (from table 8).

Douglas-fir: 17 stems X 25% = 4 stems
 Incense Cedar: 8 stems X 43% = 3 stems
 White Fir: 40 stems X 43% = 17 stems
 Total is 24 stems

The total stems (24) is divided by the total number of stems in the 10" diameter class (from table 8) to come up with the weighted average of mortality for all stems in the 10" diameter class.
 (24/65 = 37%)

Table J-10. Expected mortality within LSOG by species and diameter class with a 7' flame length

Species	10" DBH	14" DBH	18" DBH	22" DBH	26" DBH	30" DBH	34" DBH	35"> DBH
Douglas-fir	82%	14%	8%	5%	4%	3%	2%	2%
Incense Cedar	99%	99%	98%	62%	23%	19%	11%	5%
Ponderosa Pine	NA	NA	96%	43%	NA	NA	NA	3%
Sugar Pine	NA	99%	NA	30%	NA	NA	NA	13%
White Fir	99%	98%	85%	41%	19%	19%	7%	5%
Mortality of total stems/acre for each DBH class	94%	70%	57%	30%	12%	11%	5%	6%

Table J-11. Expected mortality within LSOG by species and diameter class with a 10' flame length

Species	10" DBH	14" DBH	18" DBH	22" DBH	26" DBH	30" DBH	34" DBH	35"> DBH
Douglas-fir	99%	97%	95%	61%	69%	63%	41%	11%
Incense Cedar	99%	99%	98%	97%	95%	93%	89%	74%
Ponderosa Pine	NA	NA	96%	94%	NA	NA	NA	13%
Sugar Pine	NA	99%	NA	98%	NA	NA	NA	58%
White Fir	99%	99%	98%	97%	94%	93%	81%	48%
Mortality of total stems/acre for each DBH class	99%	98%	96%	84%	82%	78%	48%	41%

The percent of the total stems killed per acre for all diameter classes was determined to assign a mortality rating for each of the three flame length categories. The following table displays this total.

Table J-12. Total percent mortality within LSOG by each diameter class/acre

Flame Length Category	10" DBH	14" DBH	18" DBH	22" DBH	26" DBH	30" DBH	34" DBH	35"+ DBH	Total % of stand killed
Flame length < 4'	13%	5%	2%	<1%	<1%	<1%	<1%	<1%	20%
Flame length 4'-8'	34%	16%	3%	<1%	<1%	<1%	<1%	<1%	53%
Flame length > 8'	36%	22%	16%	8%	4%	2%	<1%	1%	89%

The following is an example how the total percent mortality for each diameter class was determined for the figures in the last column in table 11:

Example:

For the 10" diameter class with flame lengths <4' (From table 9) the mortality of total stems/acre for the 10" diameter class (37%) was multiplied by the total number of stems/acre in the 10" diameter class (65 stems from table 8).

$37\% \times 65 = 24$ stems. The 24 stems were divided by the total number of stems of all diameter classes/acre (179 stems) which resulted in 13%.

Appendix K

Soil Characteristics Chart

Map Unit #	Soil Series Name	Soil Depth	Surface Texture	Subsoil Texture(s)
14	Bogus	60+"	very gravelly loam	clay loam
18	Bybee	60+"	loam	clay
19/20/ 190/191	Tatouche	60+"	gravelly loam	clay
24	Campfour	60+"	loam	clay loam
24	Paragon	20-40"	cobbly loam	gravelly clay loam
27	Carney	20-40"	clay	clay w/ water table
28	Carney	20-40"	cobbly clay	clay w/ water table
57/58/60	Farva	20-40"	very cobbly loam	cobbly loam
78	Greystoke	40-60"	stoney loam	extra gravelly clay loam
81	Heppsie	20-40"	clay	clay, stoney clay
82/113/ 116/125	McMullin	<20"	gravelly loam	gravelly clay loam
84	Hobit	20-40"	loam	gravelly clay loam
96	Kanutchan	40-60"	clay	clay
114/116/ 119	McNull	40-60"	clay loam	cobbly clay
119	Medco	20-40"	cobbly clay loam	clay
128	Medford	60+"	clay loam	clay
143	Pinehurst	60+"	loam	clay loam
145	Greystoke	40-60"	stoney loam	extra gravelly clay loam
152	Randcore	<12"	extra stoney loam	loam
152	Shoat	20-40"	loam	loam

Map Unit #	Soil Series Name	Soil Depth	Surface Texture	Subsoil Texture(s)
160	Rustlerpeak	20-40"	gravelly loam	cobbly clay loam
167	Sibannac	60+"	silt loam	clay loam
170/173	Skookum	20-40"	very cobbly loam	very cobbly clay loam
180	Steinmetz	60+"	sandy loam	sandy loam
207	Woodseye	<20"	very stoney loam	very cobbly loam

Appendix L

Current Allotment Situation

ALLOTMENT SUMMARIES

The following discussion summarizes the current allotment situations. Livestock grazing use within the Jenny Creek LSR includes all or part of seven separate grazing allotments.

AGATE ALLOTMENT #10109

Allotment Category - C		Of Percentage Within LSR % Federal Lands in Forested PNC		
<u>Ownership</u>	<u>Acres</u>			
BLM/O&C	97	3		
Private	160			
TOTAL	257			
Operator: Vacant		Preference: 9		
Normal Operation		Season Of Use		
2 Cattle		5/1 - 9/15	BLM	9 AUMs

This allotment is 100 percent within the Jenny Creek watershed. Winifred Miller began utilizing this allotment in 1973, acquiring 6 AUMs from 10/1 to 11/15. In 1980, she applied and received the current season and AUMs. The base property was sold in 1990. The allotment has been in non-use since 1990. Annual Jenny Creek Riparian Volunteer Projects were implemented by the Ashland Resource Area in 1988. Since that time, substantial project work has been completed within the Jenny Creek Watershed. These projects, in conjunction with decreased livestock numbers and improved livestock handling, have dramatically improved the condition of riparian areas.

KEENE CREEK ALLOTMENT #10115

Allotment Category - I		Of Percentage Within LSR % Federal Lands in Forested PNC	
<u>Ownership</u>	<u>Acres</u>		
BLM/O&C	22,863	90	
Private	23,540		
TOTAL	46,403		

Operator #1: Joe Dauenhauer	Preference 1,400		
Normal Operation	Season of Use		
350 Cattle	6/16 - 10/15	BLM	1,400 AUMs
Operator #2: James C. Miller	Preference 207		
Normal Operation	Season of Use		
59 Cattle	6/16 - 9/30	BLM	207 AUMs

Approximately 50 percent of this allotment is within the Jenny Creek LSR. Utilization studies within the allotment show that distribution of livestock has been a concern. Intensive livestock management is required to resolve distribution and accompanying forage utilization patterns natural to this area. These include placement of salt, riding, and fence maintenance. Residential development and recreational use is on the increase. Mr. Dauenhauer recognized the social and biological conflicts within the allotment and voluntarily relinquished some AUMs in 1994, which resulted in his current preference of 1,400 AUMs. A riparian demonstration area has been established on Dead Indian Creek to provide information on recovery and potential for riparian areas on the Dead Indian Plateau.

BOX R ALLOTMENT #10137

Allotment Category - C	Of Percentage Within LSR
	% Federal Lands in Forested PNC
<u>Ownership</u>	<u>Acres</u>
BLM/O&C	80
Private	50
TOTAL	<u>680</u> 760

Operator: Don Rowlett	Preference 5		
Normal Operation	Season of Use		
1 Cow	6/16 - 11/15	BLM	5 AUMs

This allotment is 100 percent within the Jenny Creek LSR.

JENNY CREEK ALLOTMENT #10108

Allotment Category - I		Of Percentage Within LSR % Federal Lands in Forested PNC		
<u>Ownership</u>	<u>Acres</u>			
BLM/O&C	1,303	10		
Private	80			
Other	<u>320</u>			
TOTAL	1,703			
Operator: Cecilia Taylor		Preference 120		
Normal Operation		Season of Use		
30 Cattle		6/1 - 9/30	BLM	120 AUMs

Approximately 95 percent of this allotment is in the Jenny Creek LSR. Prior to the Jenny Creek Riparian Projects, utilization problems within the riparian areas of this allotment were a major concern. Riparian fencing has created an opportunity for controlled rotation. Winter access to the allotment is a problem. Noxious weeds (i.e. yellow starthistle) are becoming well established.

SODA MOUNTAIN ALLOTMENT #10110

Allotment Category - I		Of Percentage Within LSR, % Federal Lands in Forested PNC		
<u>Ownership</u>	<u>Acres</u>			
BLM/O&C	35,471	50		
Private	<u>13,866</u>			
TOTAL	49,337			
Operator #1: Suzy Courtney		Preference 1,500		
Normal Operation		Season of Use		
273 Cattle		5/1 - 10/15	BLM	1,500 AUMs
Operator #2: Robert R. Miller		Preference 470		
Normal Operation		Season of Use		
104 Cattle		6/1 - 10/15	BLM	470 AUMs
Operator #3: Walt Ranch		Preference 324		
Normal Operation		Season of Use		
81 Cattle		6/16 - 10/15	BLM	324 AUMs

Approximately 70 percent of this allotment is within the Jenny Creek LSR. Grazing preference within the allotment was reduced to 2,694 AUMs from the historic preference of 4,029 AUMs in 1986. Another 400 AUMs of preference were eliminated in 1994 in the Pilot Rock area. Conflicts between livestock and home owners occur in the rural interface areas at Tyler Creek and Siskiyou Summit. Two herd districts exist adjacent to the allotment. The Green Spring herd district was formed in 1974 and the Siskiyou Summit herd district in 1983. Intensive livestock management is required to resolve distribution and accompanying forage utilization patterns natural to this area. Grazing rotates within the seven pastures. Closing gates and fence maintenance is extremely important. Utilization along Keene Creek ridge has been an area of concern in the past. Riparian areas of Keene Creek, Parsnip Lakes, and Mayfield garden are showing improvement with intensive cattle management. Yellow starthistle is encroaching at an alarming rate, especially on south slopes near the California border. Introduction of biological controls, in the form of insects which feed on yellow starthistle seedheads, has been initiated.

DIXIE ALLOTMENT #00107

Allotment Category - I
KLAMATH FALLS R.A.

Of Percentage
Within LSR,
% Federal Lands
in Forested PNC
@100

<u>Ownership</u>	<u>Acres</u>
BLM/O&C	5,547
Private	<u>22,260</u>
TOTAL	27,807

Operator: Jerry Barry
Normal Operation

Preference 415
Season of Use

75 Cattle	5/15 - 9/15	BLM	324 AUMs
125 Cattle	5/15 - 9/15	EOU	680 AUMs

Approximately 10 percent of this allotment is within the Jenny Creek LSR. A primary concern in this allotment was the cancellation of Weyerhaeuser Company exchange-of-use lease agreements. Cattle drifting onto the Weyerhaeuser lands was of concern to the company, primarily due to grazing within riparian areas. These lands recently sold to U.S. Timberlands. This allotment also includes the Pokegema Wild Horse Management Area, approximately 400 acres of which is within the Jenny Creek LSR boundary.

BUCK MOUNTAIN ALLOTMENT #00103Allotment Category - C
KLAMATH FALLS R.A.Of Percentage
Within LSR,
% Federal Lands
in Forested PNC
@100

<u>Ownership</u>	<u>Acres</u>
BLM/O&C	8,464
Private	<u>41,720</u>
TOTAL	50,184

Operator: Vacant
Normal OperationPreference 204
Season of Use44 Cattle
210 Cattle5/15 - 9/15
5/15 - 9/15BLM
EOU203 AUMs
948 AUMs

Less than 10 percent of this allotment is within the Jenny Creek LSR. The allotment and exchange-of-use land are currently in non-use; the MX ranch outside of Paisley will be the permittees starting 1999 season. This allotment is in the custodial category. Licensed use information was used to represent the normal operation. Weyerhaeuser lands were recently sold to U.S. Timberlands.

Table L-1. Grazing allotment summaries

Name	Federal Land Acres	Private Land Acres	Total Acres	Of Percentage Within LSR, % Federal Lands in Forest PNC	Status	Number of Cattle	AUMs	Season Of Use
Agate	97	160	257	03	<i>Vacant</i>	2	9	5/1-9/15
Keene Creek	22,863	23,540	46,403	90	<i>Active</i>	409	1612	6/16-10/15
Box R Ranch	80	680	760	50	<i>Active</i>	1	5	6/16-11/15
Jenny Creek	1,303	400	1,703	10	<i>Active</i>	30	120	6/1 - 9/30
Soda Mt	35,471	13,866	49,337	@ 50	<i>Active</i>	458	2294	5/1 - 10/15
Dixie	5,547	22,260	27,807	100	<i>Active</i>	200	1004	5/15 - 9/15
Buck Mt	8,464	41,720	50,184	100	<i>Vacant</i>	254	1151	5/15 - 9/15

Range Improvements: Jenny Creek Late-Successional Reserve Area

Existing range improvements, by allotment, are listed below. (Data provided is for allotments in the Ashland Resource Area; pertinent data is currently unavailable for The Klamath Resource Area.)

Keene Creek Allotment

Keene Creek Fence	750043
Chinquapin Mtn Det Dam #1	750049
Cabin Glade Detent Dam	750052
N. Chinquapin Mtn Det Dam	750053
Crane Prairie Detent Dam	750057
Chinquapin Mtn Det Dam #2	750058
Blue Jay Detent Dam	750061
Beaver Creek Detent Dam	750062
Fairchild Spring Reservoir	750347
Robco Free Reservoir	750519
Beaver Reservoir	750525
Corral Creek Pump Chance	750328
Soda Creek Pump Chance #1	750332
Soda Creek Pump Chance #2	750333
CCC Camp Reservoir	750373
Wood Duck & Songbird Boxes	750497
Beaver Creek Pump Chance #2	750514
Beaver Creek Pump Chance #3	750515
Jenny Creek Pump Chance	750503

Box R Allotment

None

Jenny Creek Allotment

State line Fence	750023
Licks Fence	750042
Dead Horse Spring	750146
Fox Fence	750270
West Boundary Cattleguard	750299
Jenny Creek Spring	750471
Jenny Creek Fence	750472
Jenny Creek Cattle guard	750473
Jenny Rip Fence	750476
Jenny Rip Cattleguard	750485
Jenny Creek Swing Gate	750494

Agate Allotment

Wright Waterhole	750033
Agate Flat Fire Seed	750184
Agate Fence	750542

Soda Mountain Allotment

<i>Oregon Gulch Pasture</i>	
Lincoln Corral	272
Dead Horse Cattleguard	498
Randcore Cattleguard	499
Oregon Gulch Detention Dam#2	065
Oregon Gulch Detention Dam#1	066
East Klamath Fence	505
Rosebud Helipond Fence	0336

<i>Keene Creek Pasture</i>	
Klamath Control Fence	0077
North Fork Detention	088
Soda Mountain Cattleguard	507
Keene Fence	0192
<i>Emigrant Pasture</i>	
Hobart Cattleguard	510
Hobart Lake Fence	479
Baldy/Tyler Creek Fence	477
Baldy Creek Cattleguard	478
Klamath Control Fence	0077
<i>Agate Flat Pasture</i>	
Klamath Control Fence	0077
Parkinson Home Reservoir	0100
Willow Pond	0134
State line Cattleguard	0500
Bear Wallow/State line Reservoir Fence	032
West Licks	085
Rocky Draw Detention Dam	086
Oak Stump Detention Dam	027
<i>Skookum Pasture</i>	
Skookum Creek Fence	0170
Cooks Camp Cattleguard	501
Klamath Control Fence	0077
Bovine Corral	275
Soda Cabin Cattleguard	508

Appendix M

Land Acquisition Criteria

1. Habitat currently occupied by a threatened, endangered, or proposed wildlife species, and expected future management under current or expected ownership would be detrimental to the site. Parcel borders BLM LSR lands.
2. Habitat currently occupied by a threatened, endangered, or proposed wildlife species, and expected future management under current or expected ownership would be detrimental to the site. Parcel does not border BLM LSR lands.
3. Habitat currently occupied by a locally endemic Survey and Manage wildlife species, and expected future management under current or expected ownership would be detrimental to the site. Parcel borders BLM LSR lands.
4. Habitat currently occupied by a locally endemic Survey and Manage wildlife species, and expected future management under current or expected ownership would be detrimental to the site. Parcel does not border BLM lands.
5. Habitat currently occupied by a threatened, endangered, or proposed wildlife species, and expected future management under current or expected ownership would be detrimental to the site. Parcel does not border BLM lands.
6. Currently late-successional habitat (Habitat Type 1 or 2) within 0.5 miles of a spotted owl site. Parcel borders BLM lands.
7. Currently spotted owl dispersal habitat (Habitat Type 5 or 6) within 0.5 miles of a spotted owl site. Parcel borders BLM LSR lands.
8. Currently late-successional habitat (Habitat Type 1 or 2) within 1.2 miles of a spotted owl site. Parcel borders BLM LSR lands.
9. Currently spotted owl dispersal habitat (Habitat Type 5 or 6) within 1.2 miles of a spotted owl site. Parcel borders BLM LSR lands.
10. Jenny Creek riparian habitat (i.e., the stream runs through it). Parcel borders BLM LSR lands.
11. Currently late-successional habitat (Habitat Type 1 or 2). Parcel borders BLM LSR lands.

12. Currently spotted owl dispersal habitat (Habitat Type 5 or 6). Parcel borders BLM LSR lands.
13. Lands with potential to develop late-successional habitat at some point in the future. Parcel borders BLM LSR lands.
14. Other lands bordering the federal LSR lands.
15. Currently late-successional habitat (Habitat Type 1 or 2) within 0.5 miles of a spotted owl site. Parcel does not border BLM LSR lands.
16. Currently spotted owl dispersal habitat (Habitat Type 5 or 6) within 0.5 miles of a spotted owl site. Parcel does not border BLM LSR lands.
17. Currently late-successional habitat (Habitat Type 1 or 2) within 1.2 miles of a spotted owl site. Parcel does not border BLM LSR lands.
18. Currently spotted owl dispersal habitat (Habitat Type 5 or 6) within 1.2 miles of a spotted owl site. Parcel does not border BLM LSR lands.
19. Jenny Creek riparian habitat (i.e., the stream runs through it). Parcel does not border BLM LSR.
20. Currently late-successional habitat (Habitat Type 1 or 2). Parcel does not border BLM LSR lands.
21. Currently spotted owl dispersal habitat (Habitat Type 5 or 6). Parcel does not border BLM LSR lands.
22. Lands with potential to develop late-successional habitat at some point in the future. Parcel does not border BLM LSR lands.
23. Other lands.

Appendix N

Regional Ecosystem Office Memos

See attached pages.

REGIONAL ECOSYSTEM OFFICE

333 SW 1st
P.O. Box 3623
Portland, Oregon 97208-3623
Phone (503)326-6265 FAX: (503) 326-6282

MEMORANDUM

DATE: April 20, 1995

To: Regional Interagency Executive Committee (See Distribution List)

From: Donald R. Knowles, Executive Director

Subject: Criteria to Exempt Specific Silvicultural Activities in LSRs and MLSAs from REO Review

Pages C-12 and C-26 of the Record of Decision (*ROD*) for the Northwest Forest Plan state that "[t]he Regional Ecosystem Office may develop criteria that would exempt some activities from review." Enclosed are criteria that exempt certain young-stand thinning, release, and reforestation projects that are proposed in Late-Successional Reserves (LSRs) and Managed Late-Successional Areas (MLSAs) from review by the Regional Ecosystem Office (REO). These criteria were developed by an interagency work group and the REO based on the review of silvicultural projects, field visits, and discussions with agencies and technical specialists. The REO may expand the review exemption criteria as experience with additional forest management activities is gained. Please distribute the attached REO review exemption criteria to the field.

It is important to note that these criteria do not affect the kind of activities the *ROD* permits within LSRs and MLSAs. The criteria apply only to the requirement for REO review of silvicultural activities in LSRs and MLSAs and only to a specific subset of silvicultural treatments. It should also be noted that compliance with the *ROD*'s standards and guidelines and other statutory and regulatory requirements is not affected by these exemption criteria. For example, requirements to do watershed analyses and Endangered Species Act consultation are not affected by the REO review exemption criteria.

Enclosure

cc:
IAC Members (See Distribution List)

362/1y

DISTRIBUTION LIST

Date: April 20, 1995

Subject: Criteria to Exempt Specific Silvicultural Activities in LSRs and MLSAs from REO Review

TO: REGIONAL INTERAGENCY EXECUTIVE COMMITTEE

Anita Frankel, Director, Forest and Salmon Group, Environmental Protection Agency
John Lowe, Regional Forester, USDA Forest Service, R-6
Stan Speaks, Area Director, Bureau of Indian Affairs
Michael Spear, Regional Director, US Fish & Wildlife Service
William Stelle, Jr., Regional Director, National Marine Fisheries Service
William Walters, Acting Regional Director, National Park Service
Elaine Zielinski, State Director, Bureau of Land Management, OR/WA

CC: OTHER MEMBERS OF INTERGOVERNMENTAL ADVISORY COMMITTEE

California

Francie Sullivan, Shasta County Supervisor
Terry Gorton, Assistant Secretary, Forestry and Rural Economic Dev., California Resource Agency

Oregon

Rocky McVay, Curry County Commissioner
Paula Burgess, Federal Forest and Resource Policy Advisor, Office of the Governor

Washington

Harvey Wolden, Skagit County Commissioner
Amy F. Bell, Deputy Supervisor for Community Relation, WA Dept. of Natural Resources
Bob Nichols, Senior Executive Policy Assistant, Governor's Office (Alternate)

Tribes

Greg Blomstrom, Planning Forester, CA Indian Forest & Fire Mgmt. Council
Mel Moon, Commissioner, NW Indian Fisheries Commission
Jim Anderson, Executive Director, NW Indian Fisheries Commission (Alternate)
Gary Morishima, Technical Advisor, Intertribal Timber Council
Guy McMinds, Executive Office Advisor, Quinalt Indian Nation

Federal Agencies

Michael Collopy, Director, Forest and Rangeland Ecosystem Science Center, Natl Biol. Service
Eugene Andreuccetti, Regional Conservationist, Natural Resources Conservation Service
Bob Graham, State Conservationist, Natural Resources Conservation Service (Alternate)
G. Lynn Sprague, Regional Forester, USDA Forest Service, R-5 (Alternate)
Thomas Murphy, Director, Environmental Research Laboratory, Environ. Protect Agency
Charles Philpot, Station Director, Forest Service; PNW
Tom Tuchmann, Director, Office of Forestry and Economic Development (Ex Officio)
Ed Haste, State Director, Bureau of Land Management, CA (Alternate)

REO Review Exemption Criteria

Background

Standards and Guidelines (S&Gs) in the "Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl" (referred to as the ROD) provide that silvicultural activities within Late-Successional Reserves (LSRs) and Managed Late-Successional Areas (MLSAs) are subject to review by the Regional Ecosystem Office (REO). The S&Gs also state that "REO may develop criteria that would exempt some activities [within LSRs and MLSAs] from review."

Based upon proposals submitted to REO for review, field visits, discussions with the agencies and technical specialists, and our understanding of LSR objectives, REO is hereby exempting the following types of activities from the REO review requirement stated on pages C-12 and C-26 of the ROD. Silvicultural projects meeting the following criteria are exempted from REO review because such projects have a high likelihood of benefitting late-successional forest characteristics.

Activities must still comply with all S&Gs in the ROD (e.g., initial LSR assessments, watershed analysis, riparian reserves) and with other statutory and regulatory requirements (e.g., National Forest Management Act, Federal Land Management Policy Act, National Environmental Policy Act, Endangered Species Act, Clean Water Act). This exemption applies only to the REO review requirement found on pages C-12 and C-26 in the ROD. Silvicultural activities described in the S&Gs that do not meet the criteria listed below continue to be subject to REO review at this time.

Silvicultural treatments in LSRs and MLSAs are exempted from REO review (ROD, pages C-12 and C-26), where the agency proposing the treatments finds that the following criteria are met:

1. **Young-Stand Thinning**, commonly referred to as TSI or precommercial thinning, where:
 - a. Young stands, or the young-stand component (understory) of two-storied stands, is overstocked. Overstocked means that reaching the management objective of late-successional conditions will be significantly delayed, or desirable components of the stand may be eliminated, because of stocking levels. The prescription should be supported by empirical information or modeling (for similar, but not necessarily these specific, sites) indicating the development of late-successional conditions will be accelerated or enhanced.
 - b. Cut trees are less than 8" dbh, and any sale is incidental to the primary objective.
 - c. Tracked, tired, or similar ground-based skidders or harvesters are not used.
 - d. Treatments promote a natural species diversity appropriate to meet late- successional objectives; including hardwoods, shrubs, forbs, etc..
 - e. Treatments include substantially varied spacing in order to provide for some very large trees as quickly as possible, maintain areas of heavy canopy closure and decadence, and encourage the growth of a variety of species appropriate to the site and the late-successional objective.

- f. Treatments minimize, to the extent practicable, the need for future entries.
- g. Cutting is by hand tools, including chain saws.
- 2. **Release**, also commonly referred to as TSI, where:
 - a. There is undesirable vegetation (competition) which delays attainment of the management objective of late-successional conditions, or desirable components of the stand may be eliminated, because of such competition. The prescription should be supported by empirical information or modeling (for similar, but not necessarily these specific, sites) indicating the development of late-successional conditions will be accelerated or enhanced.
 - b. Cut material is less than 8" dbh, and any sale is incidental to the primary objective.
 - c. Tracked, tired, or similar ground-based skidders or harvesters are not used.
 - d. Treatments promote a natural species diversity appropriate to meet late- successional objectives, including hardwoods, shrubs, forbs, etc.
 - e. Cutting is by hand tools, including chain saws.
- 3. **Reforestation and Revegetation**, including incidental site preparation, release for survival, and animal damage control, where:
 - a. No site preparation is required other than hand scalping.
 - b. Reforestation is necessary to quickly reach late-successional conditions, protect site quality, or achieve other ROD objectives.
 - c. Treatments promote a natural species diversity appropriate to meet late- successional objectives, including hardwoods, shrubs, forbs, etc.
 - d. Treatments, either through spacing, planting area designation, or expected survival or growth patterns, result in substantially varied spacing in order to provide for some very large trees as quickly as possible, create areas of heavy canopy closure and decadence, and encourage the growth of a variety of species appropriate to the site and the late-successional objective.
 - e. Treatments minimize, to the extent practicable, the need for future entries.

REGIONAL ECOSYSTEM OFFICE

333 SW 1st
P.O. Box 3623
Portland, Oregon 97208-3623
Phone (503)326-6265 FAX: (503) 326-6282

MEMORANDUM

DATE: July 9, 1996

To: **Regional Interagency Executive Committee (RIEC)**
Ken Feigner, Director, Forest & Salmon Group, Environmental Protection Agency
Robert W. Williams, Regional Forester, R-6, Forest Service
Stan M. Speaks, Area Director, Bureau of Indian Affairs
Michael J. Spear, Regional Director, U.S. Fish & Wildlife Service
William Stelle, Jr., Regional Director, National Marine Fisheries Service
William C. Walters, Deputy Field Director, National Park Service
Elaine Y. Zielinski, State Director, Oregon/Washington, Bureau of Land Management

From: Donald R. Knowles, Executive Director

Subject: Criteria to Exempt Specific Silvicultural Activities in Late-Successional Reserves and Managed Late-Successional Areas from Regional Ecosystem Office Review

Enclosed are criteria that exempt certain commercial thinning projects in Late-Successional Reserves (LSRs) and Managed Late-Successional Areas (MLSAs) from review by the Regional Ecosystem Office (REO), pursuant to pages C-12 and C-26 of the Northwest Forest Plan (NFP) Record of Decision (ROD). These criteria were developed by an interagency work group and the REO based on review of silvicultural projects, field visits, and comments from agencies, researchers, and technical specialists.

We believe we are ready for these exemptions. Several versions of these criteria have been distributed to your agencies and others for review over the last several months. The comments received have been used to help clarify and focus the criteria. Use of the criteria will expedite implementation of beneficial silvicultural treatments in LSRs and MLSAs. We suggest that you transmit them to your field units at your earliest convenience.

It is important to note that these criteria do not affect the kind of activities the ROD permits within LSRs and MLSAs. The criteria simply exempt a specific subset of silvicultural treatments from the requirement for project level REO review of silvicultural activities within LSRs and MLSAs. Please also note that compliance with the ROD's standards and guidelines and other statutory and regulatory requirements is not affected by these exemption criteria. For example, requirements to do watershed analyses and Endangered Species Act consultation are not affected by the REO review exemption criteria.

We expect implementation monitoring procedures of the Northwest Forest Plan to select enough silvicultural projects within LSRs and MLSAs, both exempted and reviewed, to determine if actual projects meet standards and appropriate criteria. Obviously, if any of you have questions or comments about the attached, please call me directly at 503-326-6266, Dave Powers at 503-326-6271, or Gary S. Sims at 503-326-6274.

cc: IAC, RMC, LSR Workgroup
Enclosure
694/ly

Criteria Exempting Certain Commercial Thinning Activities From REO Review

Background

Standards and Guidelines (S&Gs) in the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (ROD) provide that silvicultural activities within Late-Successional Reserves (LSRs) and Managed Late-Successional Areas (MLSAs) are subject to review by the Regional Ecosystem Office (REO). The S&Gs also state that the REO may develop criteria that would exempt some activities (within LSRs and MLSAs) from review.

Based upon project proposals submitted to the REO for review, field visits, discussions with the agencies, researchers, and technical specialists, and our understanding of LSR objectives, the REO is hereby exempting certain commercial thinning activities (sometimes referred to as density management activities) from the REO review requirement (ROD, pages C-12 and C-26). Silvicultural projects meeting the criteria below are exempted from REO review because such projects have a high likelihood of benefitting late-successional forest conditions. Many of the commercial thinning proposals reviewed thus far by the REO have met these criteria.

In some cases the criteria refer to the prescription. All silvicultural treatments within LSRs will be conducted according to a silvicultural prescription fully meeting agency standards for such documents. A description of the desired future condition (DFC), and how the proposed treatment is needed to achieve the DFC, are key elements in this prescription. The description of desired future condition should typically include desired tree species, canopy layers, overstory tree size (e.g., diameter breast height), and structural components such as the range of coarse woody debris (CWD) and snags.

Some elements of these exemption criteria may seem prescriptive, and reviewers suggested several changes to accommodate specific forest priorities. While such suggestions may have been within the scope of the S&Gs, there are several reasons they are not included here:

These criteria are based on numerous submittals already reviewed by the REO and found to be consistent with the S&Gs. Other treatments, such as thinning with fire, may be equally appropriate. The REO simply has not had sufficient experience with such prescriptions within LSRs to write appropriate exemption criteria at this time. Agencies are encouraged to develop and submit such prescriptions for review. The REO will consider supplementing or modifying these criteria over time.

These criteria apply range wide. It may be more appropriate to seek exemption at the time of LSR assessment review where specific vegetation types, provincial issues, or objectives do not fit within these criteria or where silvicultural prescriptions are needed other than as described below.

These exemption criteria are not standards and guidelines, and projects meeting LSR objectives but not fitting these criteria should continue to be forwarded to the REO for review.

Four other key points about thinning are important to consider when developing thinning prescriptions:

1. We urge caution in the use of silvicultural treatments within LSRs. Silvicultural treatments within old habitat conservation areas (HCAs) and designated conservation areas (DCAs) were extremely limited, and many of the participants in the Forest Ecosystem Management Assessment Team/Supplemental Environmental Impact Statement (FEMAT/SEIS) process advanced good reasons for continuing such restrictions. Only high eastside risks and a case made that late-successional conditions could clearly be advanced by treatments in certain stand conditions led decision makers toward the current S&Gs. Note that the examples for the westside (S&Gs, page C-12) are for even-age stands and young single-species stands. Agencies must recognize when younger stands are developing adequately and are beginning to become valuable to late-successional species. Such stands should be left untreated unless they are at substantial risk to large-scale disturbance.
2. Thinning can easily remove structural components or impede natural processes such as decay, disease, or windthrow, reducing the stands value to late-successional forest-related species. Thinning prescriptions that say leave the best, healthiest trees could eliminate structural components important to LSR objectives.
3. While historic stand conditions may be an indicator of a sustainable forest, they are not the de facto objectives. The S&Gs require an emphasis toward late-successional conditions **to the extent sustainable**.
4. Treatments need to take advantage of opportunities to improve habitat conditions beyond natural conditions. For example, exceeding natural levels of CWD within a 35-year-old stand can substantially improve the utility of these stands for late-successional forest-related species. Treatments must take advantage of opportunities to optimize habitat for late-successional forest-related species in the short term.

Relation to S&Gs and Other Exemption Criteria

Exempted thinnings must still comply with all pertinent S&Gs in the ROD (e.g., initial LSR assessments watershed analyses, riparian reserves) and with other statutory and regulatory requirements (e.g., National Forest Management Act, Federal Land Management Policy Act, National Environmental Policy Act, Endangered Species Act, Clean Water Act). Interagency cooperation, monitoring, and adaptive management are key components of the ROD and were key assumptions underlying the development of these criteria. Additionally, field units are strongly encouraged to engage in intergovernmental consultation when developing projects. This exemption applies only to the REO review requirement (ROD, pages 0-12 and C-26). Many treatments not meeting these exemption criteria may be appropriate within LSRs and MLSAs, and these treatments remain subject to REO review. These exemption criteria are in addition to criteria issued April 20, 1995, for Young Stand Thinning, Release, and Reforestation and Revegetation, and are in addition to exemption criteria adopted through the LSR assessment review process.

EXEMPTION CRITERIA

Silvicultural treatments in LSRs and MLSAs are exempted from REO review (ROD, pages 0-12 and 0-26) where the agency proposing the treatments finds that ALL of the following criteria are met:

Objectives

1. The objective or purpose of the treatment is to develop late-successional conditions or to reduce the risk of large-scale disturbance that would result in the loss of key late-successional structure. Further, the specific treatment would result in the long-term development of vertical and horizontal diversity, snags, CWD (logs), and other stand components benefiting late-successional forest-related species. The treatment will also, to the extent practicable, create components that will benefit late-successional forest-related species in the short term.

Timber volume production is only incidental to these objectives and is not, in itself, one of the objectives of the treatment. Creation or retention of habitat for early successional forest-related species is not a treatment objective.

2. Negative short-term effects to late-successional forest-related species are outweighed by the long-term benefits to such species and will not lessen short-term functionality of the LSR as a whole.
3. The leave-tree criteria provide for such things as culturing individual trees specifically for large crowns and limbs and for the retention of certain characteristics that induce disease, damage, and other mortality or habitat, consistent with LSR objectives. Healthiest, best tree criteria typical of matrix prescriptions are modified to reflect LSR objectives.
4. Within the limits dictated by acceptable fire risk, CWD objectives should be based on research that shows optimum levels of habitat for late-successional forest-related species, and not be based simply on measurements within natural stands. For example, recent research by Carey and Johnson in young stands on the westside indicates owl prey base increases as CWD (over 4") within Douglas-fir forests increases, up to 8- to 10-percent groundcover south of the town of Drain, Oregon, and 15-percent groundcover north of Drain, increasing to 15 to 20 percent in the Olympic Peninsula and Western Washington Cascades. Other references that could help identify initial considerations involving natural ranges of variability in CWD include Spies and Franklin, for discussions on Washington Cascades, Oregon Cascades, and Coast Ranges; and Graham, et al., for east of the Cascades.

If tree size, stocking, or other considerations preclude achievement of this objective at this time, the prescription includes a description of how and when it will be achieved in the future.

5. Agencies having an interest in LSR projects proposed under these criteria should continue to be given the opportunity to participate in project development.

Stand Attributes

1. The stand is currently not a complex, diverse stand that will soon meet and retain late-successional conditions without treatment.
2. West of the Cascades outside of the Oregon and California Klamath Provinces, the basal-area-weighted average age of the stand is less than 80 years. Individual trees exceeding 80 years in those provinces, or exceeding 20-inches dbh in **any** province, shall not be harvested except for the purpose of creating openings, providing other habitat structure such as downed logs, elimination of a hazard from a standing danger tree, or cutting minimal yarding corridors. Where older trees or trees larger than 20-inches dbh are cut, they will be left in place to contribute toward meeting the overall CWD objective. Thinning will be from below, except in individual circumstances where specific species retention objectives have a higher priority. Cutting older trees or trees exceeding 20-inches dbh for **any** purpose will be the exception, not the rule.
3. The stand is overstocked. Overstocked means that reaching late-successional conditions will be substantially delayed, or desirable components of the stand will likely be eliminated, because of stocking levels.

Treatment Standards

1. The treatment is primarily an intermediate treatment designed to increase tree size, crown development, or other desirable characteristics (S&Gs, page B-5, third paragraph); to maintain vigor for optimum late-successional development; to reduce large-scale loss of key late-successional structure; to increase diversity of stocking levels and size classes within the stand or landscape; or to provide various stand components beneficial to late-successional forest-related species.
2. The prescription is supported by empirical information or modeling (for similar, but not necessarily these specific sites) indicating that achievement of late-successional conditions would be accelerated.
3. The treatment is primarily an intermediate thinning, and harvest for the purpose of regenerating a second canopy layer in existing stands is no more than an associated, limited objective as described below under openings and heavily thinned patches.
4. The treatment will increase diversity within relatively uniform stands by including areas of variable spacing as follows:

Ten percent or more of the resultant stand would be in unthinned patches to retain processes and conditions such as thermal and visual cover, natural suppression and mortality, small trees, natural size differentiation, and undisturbed debris.

Three to 10 percent of the resultant stand would be in openings roughly 1/4 to 1/2 acre in size to encourage the initiation of structural diversity.

Three to 10 percent of the resultant stand would be in heavily thinned patches (e.g., less than 50 trees per acre) to maximize individual tree development and encourage some understory vegetation development.

The treatment does not inappropriately simplify stands by removing layers or structural components creating uniform stocking levels or removing broken and diseased trees important for snag recruitment, nesting habitat, and retention of insects and diseases important to late-successional development and processes.

5. To the extent practicable for the diameter and age of the stand being treated, the treatment includes falling green trees or leaving snags and existing debris to meet or make substantial progress toward meeting an overall CWD objective.
6. Snag objectives are to be identified as part of the DFC. Prescriptions must be designed to make substantial progress toward the overall snag objective, including developing large trees for future snag recruitment and retaining agents of mortality or damage. To the extent practicable for the diameter and age of the stand being treated, each treatment includes retention and creation of snags to meet the DFC. Publications useful in identifying snag-related DFCs include but are not limited to Spies, et al.

To the extent snag requirements for late-successional species are known, one objective is to attain 100 percent of potential populations for all snag-dependent species.

7. The project-related habitat improvements outweigh habitat losses due to road construction.

Cited References:

Carey, A.B., and M.L. Johnson. 1995. Small mammals in managed, naturally young, and old-growth forests. *Ecological Applications* 5:336-352.

Graham, R.T., A.E. Harvey, M.F. Jurgensen, T.B. Jam, J.R. Tonn, D.S. Page-Dumroese. 1994. Managing coarse woody debris in forests of the Rocky Mountains. Res. Paper INT-RPA77. USDA Forest Service, Intermountain Research Station, Ogden, UT. 12p.

Spies, T.S. and J.F. Franklin. 1991. The structure of natural young, mature, and old-growth Douglas-fir forests in Oregon and Washington. Pages 19-121 in: Ruggiero, L.F., K.B. Aubry, A.B. Carey, M.H. Huff (tech. coords). *Wildlife and Vegetation on Unmanaged Douglas-fir Forests*. Gen. Tech. Rep. GTR-PNW-285. USDA Forest Service, Pacific Northwest Research Station, Portland, OR.

REGIONAL ECOSYSTEM OFFICE

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MEMORANDUM

DATE: September 30, 1996

TO: **Regional Interagency Executive Committee (RIEC)**
Mike Collopy, Center Director, Forest & Rangeland Science Center, National Biological Service
Ken Feigner, Director, Forest & Salmon Group, Environmental Protection Agency
Thomas Mills, Station Director, Pacific Northwest Station, Forest Service
Thomas Murphy, Director, Environmental Research Lab, Environmental Protection Agency
Stan M. Speaks, Area Director, Bureau of Indian Affairs
Michael J. Spear, Regional Director, U.S. Fish & Wildlife Service
William Stelle, Jr., Regional Director, National Marine Fisheries Service
William C. Walters, Deputy Field Director, National Park Service
Robert W. Williams, Regional Forester, R-6, Forest Service
Elaine Y. Zielinski, State Director, Oregon/Washington, Bureau of Land Management

SUBJECT: Amendment to "Criteria to Exempt Specific Silvicultural Activities in Late-Successional Reserves and Managed Late-Successional Areas from Regional Ecosystem Office Review" of July 9, 1996

On July 9, 1996, the Regional Ecosystem Office (REO) released criteria to exempt certain commercial thinning projects in Late-Successional Reserves (LSRS) and Managed Late-Successional Areas (MLSAs) from review. The memo stated, in part, that the "REO will consider supplementing or modifying these criteria over time." This memo contains the first amendment to the July 9 criteria.

After issuance of the July 9 criteria, members of my staff and the LSR Work Group continued to review current research, particularly that of Drs. Andrew Carey and Connie Harrington on commercial thinning in northwest Washington. Based on this additional review, it is apparent that although 1/4 to 1/2 acre openings will add structural diversity in some stands, they are larger than needed to improve small mammal populations (forage species for northern spotted owls), and are larger than normal processes would typically create in the course of naturally developing late-successional forests. "Best guess" thinning studies currently being conducted by the researchers do not include openings this large. Therefore, the second and third bullets under Treatment Standard #4 in the July 9 Exemption Criteria are combined to now read:

"Three to 10 percent of the resultant stand would be in heavily thinned patches (i.e., less than 50 trees per acre), or in openings up to 1/4 acre in size, to maximize individual tree development, encourage some understory vegetation development, and encourage the initiation of structural diversity."

Please implement this amendment at the earliest convenient time. However, projects already planned under the original July 9, 1996, version of the exemption criteria remain exempted from REO review. We suggest you transmit this amendment to your field units at your earliest convenience.

cc:
REO Reps
LSR Work Group
801/ly

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MEMORANDUM

DATE: August 31, 1995
To: John E. Lowe, Regional Forester
FROM: Donald R. Knowles, Executive Director
SUBJECT: Late-Successional Reserves Boundary Adjustments

As requested, we have taken a brief look at your proposed letter dealing with the expansion of ski areas into Late-Successional Reserves (LSR). I think I can summarize our basic reaction in the following comments:

1. We agree that forest supervisors have the authority to consider, and propose, LSR boundary adjustments to take into consideration changing circumstances. Your *Record of Decision (ROD)* citations (*ROD*, p. C-I 7 and p.58) support this view. While the *ROD* on page C-17 states, "Development of new facilities that may adversely affect Late-Successional Reserves should not be permitted," the *ROD* goes on to state, "New development proposals that address public needs or provide significant public benefits, such as powerlines, pipelines, reservoirs, recreation sites, or other public works projects will be reviewed on a case-by-case basis and may be approved when adverse effects can be minimized and mitigated." These comments on LSR boundary adjustments could also apply to other multiple-use activities as well.
2. It would follow that, in our view, forest supervisors do not need to summarily dismiss such proposals, particularly in the case where projects address public needs or provide significant public benefits. While the *ROD* has specific review processes, agencies have not given up their statutory authority to propose changes and amendments to plans.
3. It would also follow that line officers would need to prepare appropriate assessment (including, I assume, such items as NEPA documentation and LSR assessments) of such proposals and consider the public impacts and comments associated with those proposals.
4. Finally, it would be appropriate to bring those proposals to the REO/RIEC for review to determine whether those actions are consistent with the objectives of the *ROD*. REO/RIEC may advise that some proposals may not be consistent. However, I would expect that appropriate mitigation measures, if any, could be developed for most proposals for consideration by the decision-making agency.

I have also redrafted your letter to add a few points. I hope the "tone" I have tried to enhance reflects our original intentions.

Please do not hesitate to let me know if I can be of further assistance.

473/ly

**UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT**

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